A SOLID WASTE MANAGEMENT STRATEGY FOR BRITISH COLUMBIA:

TECHNICAL REPORT AND RECOMMENDATIONS OF THE

MUNICIPAL SOLID WASTE MANAGEMENT TASK FORCE

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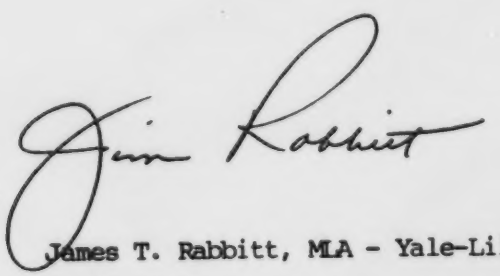
LETTER OF TRANSMITTAL

February 1, 1989

In accordance with the Terms of Reference provided by the Honourable Bruce Strachan, Minister of Environment, I am pleased to submit a Municipal Solid Waste Strategy for British Columbia.

As requested, this report reviews municipal solid waste issues and concerns in British Columbia, along with the suitability and requirements of alternatives to landfill disposal.

Respectfully submitted,



James T. Rabbitt, MLA - Yale-Lillooet
Chairman
Task Force on Municipal Solid Waste

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Within the Ministry of Environment, the Task Force would like to thank the regional waste management staff who provided extensive briefings on the solid waste management problems in their areas. The Task Force would like to extend their personal thanks to Linda Belliveau of the Public Affairs and Communication Branch, who organized a great deal of our tour, and Leah Waddington and Debbie Renema of the Planning and Assessment Branch who undertook the chore of typing this report.

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SUMMARY OF RECOMMENDATIONS

SOLID WASTE PLANNING AND MANAGEMENT

RECOMMENDATION 1: Page 16

The Government adopt as its policy and priorities in solid waste management the 5 R's - reduce, reuse, recycle, recover and residual management.

RECOMMENDATION 2: Page 17

The Government set a five year provincial goal of reducing the municipal solid waste stream by a minimum of 25% through recycling and by a further 10% at least through the composting of leaf and yard wastes plus backyard composting of household organics.

RECOMMENDATION 3: Page 18

All regional districts be required to prepare Solid Waste Management Plans by December 31, 1994. Any municipalities not covered by a regional district plan are to prepare their own plan by that date.

RECOMMENDATION 4: Page 18

Solid Waste Management Planning Grants of $5,000 plus 50% of the next $10,000 to a maximum of $10,000 per applicant be given to regional districts and municipalities undertaking Solid Waste Management Plans and regional districts be eligible for a similar grant for each municipality included within its plan.

RECOMMENDATION 5: Page 20

In order to provide local government with the information required to conduct Solid Waste Management Plans, the Ministry of Environment conduct the following studies:

a) A review and update of the provincial municipal objectives for landfills and incinerators.

b) The estimation for representative communities in British Columbia of the true cost of landfills including capital, operating, closure, post-closure, and environmental costs.

c) The estimation of the true costs of incineration for a representative sample of communities including capital, operating, ash disposal and environmental costs.

d) The estimation of the current material composition by weight and by volume of the municipal solid waste stream, as separated into residential and commercial/industrial wastes. This study should be repeated every five years to identify any emerging trends.

e) The development of procedures to estimate the volumes of wastes being disposed of at smaller landfill sites, where the weighing of the wastes is impractical.

f) The development of municipal recycling and composting manuals which detail the methods, equipment, personnel and costs of implementing various municipal recycling and composting options.

g) A review of rural solid waste transfer station options including their design, operation and costs.

h) The development of an office waste paper recovery manual for use by government, institutions and businesses.

i) A review of methods for collecting recyclable materials from apartments and commercial buildings.

j) A study of consumer product packaging as a component of the solid waste stream and the options available for reducing its volume.

k) The development of a data base on recyclable material markets, prices and quantities recovered. The data base is to be updated annually.

l) A study of the environmental impacts of degradable plastics both photo and bio-degradable.

RECOMMENDATION 6: Page 22

The Province establish through the Ministry of Advanced Education and Job Training one or more faculty research fellowships at British Columbia's universities to conduct research into solid waste management and disposal methods.

RECOMMENDATION 7: Page 24

The Ministry of Environment establish a Solid Waste Management and Recycling Section within the Waste Management Branch. The section should include the following functions:

a) Management
b) Municipal Recycling Coordination
c) Commercial/Industrial Recycling Coordination
d) Recyclable Material Market Coordination
e) Grant Administration
f) Solid Waste Disposal Engineering
g) Administrative Support

The establishment of positions will need to be phased with the program implementation and adequate personnel allotments introduced to each function as determined necessary by the Ministry.

RECOMMENDATION 8: Page 26

The Minister of Environment establish, and appoint people to, a Municipal Solid Waste and Recycling Advisory Committee. Members should

be appointed from local governments, recyclers, industry, consumer groups and the general public. The advisory committee should then develop sub-committees to address municipal issues, recycling, packaging and litter control.

RECOMMENDATION 9: Page 26

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to make solid waste disposal a regional district function.

RECOMMENDATION 10: Page 27

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to remove the limitations on local governments in raising revenues for solid waste disposal.

RECOMMENDATION 11: Page 27

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to require local governments with a solid waste disposal function to establish a capital reserve to pay for the long-term environmental costs of solid waste disposal facilities including incineration refurbishment and landfill closure and post-closure.

RECOMMENDATION 12: Page 28

The Government direct all provincial Ministries, agencies and Crown corporations which use local government waste disposal facilities to pay for their use of those facilities. The payment may be made in either cash or in kind.

RECOMMENDATION 13: Page 28

The Ministry of Environment should continue in its cooperative approach in assisting municipal permittees who are not operating in compliance

with their discharge permit where the permittee is working to correct the problem. However, the Ministry should strictly enforce the permit requirements where corrective actions are not taking place.

MUNICIPAL RECYCLING AND COMPOSTING

RECOMMENDATION 14: Page 43

The Ministry of Environment establish a five year Recycling and Composting Capital Grant Program for local governments. Local governments are to be eligible for capital grants only if recycling and/or composting of leaf and yard wastes were shown in their Solid Waste Plans to be justified and that markets for the materials produced had clearly been identified. The grants are to be for:

a) 100% of the cost of household containers, to a maximum of $8 per household, for residential recycling programs. Wherever practical, a standard recycling container is to be supplied in lieu of the equivalent funds.

b) 1/3 of the capital cost of equipment used primarily for recycling or composting.

c) 1/3 of the capital cost of apartment recyclable material storage containers.

d) 1/3 of the capital costs of rural recycling depot drop-off containers.

e) 1/3 of the capital costs of backyard home composters up to a maximum of $20 per composter.

f) 50% of recycling programs initial promotion and education costs up to 50¢ per household.

RECOMMENDATION 15: Page 46

The Province show leadership in the recycling field by establishing an office paper recovery demonstration project in all provincial government offices. The project is to begin with the Parliament Buildings and the Ministry of Environment's Victoria area offices and after six months should expand to all Ministries, Crown Corporations and agencies in the Victoria and Vancouver area. The program should expand to other areas of the province as soon as paper markets have been identified.

RECOMMENDATION 16: Page 48

The Ministry of Environment establish a Commercial Recycling Program to promote and provide technical support for the establishment of commercial source separation recycling programs.

RECOMMENDATION 17: Page 49

The Ministry of Environment work with the Greater Vancouver Regional District and other local governments to expand the use of a recycling hotline to cover the entire province through the use of a toll-free telephone number and that the province fund 50% of the cost of the program.

RECOMMENDATION 18: Page 52

The Ministry of Environment provide interim funding of $25,000 or 50% of the annual costs of the Recycling Council of British Columbia's Industrial Waste Exchange while the Canadian Council of Resource and Environment Ministers reviews the establishment of a national waste exchange system.

RECOMMENDATION 19: Page 53

Local governments, when establishing recycling programs, are encouraged to use existing facilities and to integrate established programs wherever possible.

RECOMMENDATION 20: Page 54

Local governments should be left to determine the best means, either by the public or private sector, for the collection and processing of recyclable materials in their community.

RECOMMENDATION 21: Page 54

While the use of handicapped and special needs workers is strongly encouraged in recycling programs, the program's viability should not be made dependent on the availability of federal or provincial job training grant programs.

RECOMMENDATION 22: **Page 55**

The Ministry of Environment should consider amending the Waste Management Act to include a provision prohibiting the scavenging of materials set out for a municipally authorized recycling program if municipal by-laws prove to be ineffective.

DEVELOPING THE RECYCLING INDUSTRY AND MARKETS

RECOMMENDATION 23: Page 62

The recycling industry in British Columbia should be recognized as a valuable manufacturing, job creating and trade development industry and the recycling industry be treated as a priority industry for the economic development programs of the Ministry of Regional Development.

RECOMMENDATION 24: Page 67

The Province establish a procurement policy giving preference to materials made in British Columbia in whole or in part from recyclable materials. Initially the procurement policy is to be for paper products, giving first preference to products containing 25% or more post-consumer fibre and second preference to those containing 1% or more post-consumer fibre, and for lubricating oils containing at least 50% rerefined oil. Other materials are to be added as they are shown to be economically viable. While no price preference is recommended, the Province is to annually review and set procurement goals for each material, for example in the first year the Province should purchase a minimum of 25% of its car and light duty truck lubricating oils from rerefiners.

RECOMMENDATION 25: Page 67

Other levels of government, institutions and industries should be encouraged to develop procurement policies similar to that of the Province.

RECOMMENDATION 26: Page 69

The Province exempt capital equipment and material primarily used for the collection, processing and manufacturing of recyclable materials from the Social Service Tax.

RECOMMENDATION 27: Page 70

The Province request the Federal Government to exempt capital equipment and material purchased for the collection, processing and manufacturing of recyclable material from the Manufacturers Sales Tax.

RECOMMENDATION 28: Page 70

The Federal Government be requested to extend the Accelerated Capital Cost Allowance for pollution control equipment to include capital equipment used to process and manufacture recyclable material.

RECOMMENDATION 29: Page 72

The Ministry of Transportation and Highways in conjunction with the Ministry of Environment review provincial transportation regulations to facilitate the backhauling of recyclable materials and to reduce any other transportation barriers for recyclable materials.

RECOMMENDATION 30: Page 73

The Province establish a Recycled Product Research and Development Fund of $200,000 per year for five years. This fund, to be administered by the Ministry of Environment, is to be used for the funding of research and development of new methods of collecting recyclable materials, new uses for recyclable materials and new production techniques.

RECOMMENDATION 31: Page 73

The Ministry of Environment collect and disseminate on an ongoing basis information on research and development into new production methods and new products made from recyclable materials.

RURAL AREA WASTE MANAGEMENT

RECOMMENDATION 32: Page 80

The Ministry of Environment establish a Rural Transfer Station Capital Grant Program to provide 50% of the capital costs of establishing a rural transfer station up to a maximum of $20,000 per site.

RECOMMENDATION 33: Page 82

The Ministry of Environment establish a Rural Auto Hulk and White Goods Collection Program to fund 50% of the collection costs. This program is to assist in the collection to a central location of auto hulks and white goods in rural regional districts every second year. The regional district is to be responsible for identifying the sites of the auto hulks and white goods and, with the Ministry, contract for their collection.

RECOMMENDATION 34: Page 83

Remote camps of less than 100 people be required to dispose of its refuse by daily incineration or by the provision of bear-proof containers. Otherwise a waste disposal permit shall be required.

RECOMMENDATION 35: Page 83

The Minister of Environment seek funding from the federal Minister of Indian and Northern Affairs to pay for Native Indian Band use of local government waste disposal facilities.

RECOMMENDATION 36: Page 84

The Ministry of Environment review its regional staff and budget requirements for the management and planning of the solid waste program.

ENERGY AND RESOURCE RECOVERY

RECOMMENDATION 37: Page 89

The Ministers of State in regions with a woodwaste problem make energy-from-woodwaste projects a priority for assistance in their economic development regions.

RECOMMENDATION 38: Page 89

The Ministry of Energy, Mines and Petroleum Resources expand their proposed energy-from-waste assistance program to include projects which produce refuse derived fuel.

PUBLIC AND CONSUMER EDUCATION

RECOMMENDATION 39: Page 91

That the Ministry of Education incorporate waste management and recycling education into the school curriculum.

RECOMMENDATION 40: Page 92

The Ministry of Environment establish a School Recycling Program to fund the cost of storage containers for source separation recycling projects in schools, colleges and universities and provide technical support for their set-up.

RECOMMENDATION 41: Page 92

The Ministry of Environment produce a monthly or quarterly recycling newsletter to promote recycling.

RECOMMENDATION 42: Page 92

The Ministry of Environment undertake a province-wide consumer education program on the role of recycling and on consumer choices in product packaging.

RECOMMENDATION 43: Page 93

The Ministry of Environment prepare and implement a long-term public anti-litter education program.

LITTER CONTROL

RECOMMENDATION 44: Page 108

The Province maintain a beverage container refund/deposit system. Should curbside collection and rural recycling programs exhibit participation levels indicative of an effective container recovery option, consideration could be given to phasing out refund/deposit requirements.

RECOMMENDATION 45: Page 108

The beverage containers included in the refund/deposit system include rigid sealed containers of soft-drinks, fruit drinks, mineral water, water, beer, ale, cider and coolers. Dairy products, non-dairy milk substitutes and fruit juices, defined as a beverage of 85% or more fruit juice, be exempted from the deposit requirement.

RECOMMENDATION 46: Page 108

The Province make it mandatory for the bottlers, brewers and import distributors of prescribed beverage containers to collect a minimum deposit on any container sold of 5¢ per container of one litre or less and 20¢ per container greater than one litre. In addition, it is the bottler, brewer or import distributors responsibility to collect their containers which have been returned to retailers, depots or recyclers.

RECOMMENDATION 47: Page 109

A handling fee of 2¢ per prescribed soft-drink, fruit-drink, mineral water and water container returned be paid to retailers, depots, and recyclers by the bottlers or import distributors for any container returned by a consumer. In addition, any number of containers, purchased through one receipted transaction, can be returned to the same retailer after suitable prior notification has been given.

RECOMMENDATION 48: Page 109

A system of bottle depots for the return of all prescribed beverage containers be encouraged in addition to the current return-to-retailer system.

RECOMMENDATION 49: Page 109

A tax of 2¢ per container be placed on soft-drink, fruit-drink, mineral water and water sold in non-rigid sealed containers; such funds generated to be used for implementing anti-litter and clean-up programs.

RECOMMENDATION 50: Page 109

The Ministry of Environment conduct a comprehensive litter study which should determine:

a) the composition of litter
b) who litters and why
c) the effectiveness of alternate anti-litter strategies
d) the extent of local wine and liquor bottle litter
e) implementation of a Litter Tax.

RECOMMENDATION 51: Page 110

The Province work with the Governments of the other three Western Provinces to standardize beverage container deposits and to work to have the minimum deposit for containers of one litre or less set at 10¢.

RECOMMENDATION 52: Page 110

The Ministry of Environment work with industry to promote the use of anti-litter logos on unsealed beverage containers (eg. disposal cups) and other convenience food packaging.

RECOMMENDATION 53: Page 111

The Ministry of Environment develop sound investigative measures to control illegal dumping of residential waste in an attempt to establish good precedents for successful charges and consult with the Ministry of Attorney General in drafting legislation to facilitate the prosecution of littering offenders.

PACKAGING

RECOMMENDATION 54: Page 115

The Minister of Environment through the Canadian Council of Resource and Environment Ministers advance as quickly as possible the development of a national strategy for the reduction of packaging materials and other wastes.

RECOMMENDATION 55: Page 115

The Ministry of Environment promote to industry the principle of "designing for recyclability". That is that manufacturers when designing a product strive to ensure that their consumer products are able to be safely and economically recycled using existing recycling technology and methods. In British Columbia, the immediate potential for paper substitutes in egg cartons, fast food clam-shells, etc. should be considered.

SPECIAL WASTES IN THE MUNICIPAL WASTE STREAM

RECOMMENDATION 56: Page 120

The Province treat the location and development of a provincial special waste disposal facility as an urgent priority.

RECOMMENDATION 57: Page 120

The Province fund 1/3 of the cost of building and site preparation of a facility for the storage of special wastes diverted from the municipal solid waste stream in communities who wish to establish such programs.

RECOMMENDATION 58: Page 120

The Ministry of Environment produce a household special waste collection manual for use by participating local governments and conduct personnel training courses on the handling and storage of such wastes.

RECOMMENDATION 59: Page 120

The Province accept responsibility for the disposal of any potential special wastes which it requested a municipal facility to accept.

RECOMMENDATION 60: Page 120

The Province fund 1/3 of the capital costs of waste oil storage containers at municipal waste disposal facilities.

RECOMMENDATION 61: Page 121

The Province, on the basis of the Biomedical Task Force report, adopt a strategy for the control of these wastes and collaborate with regional governments on the need and feasibility of integrated management systems.

OTHER WASTE PROBLEMS

RECOMMENDATION 62: Page 122

The Ministry of Environment develop a clear policy for landfill operators and scrap metal dealers about handling and disposing of white

goods and the special waste status of component chemicals. In addition, white goods should be a priority for the market development activities of the proposed Solid Waste Management and Recycling Section.

RECOMMENDATION 63: Page 123

The Ministry of Environment and the Ministry of Agriculture and Fisheries examine the problems of fish farm wastes and animal carcass disposal and provide recommendations for their correction.

RECOMMENDATION 64: Page 124

The Ministry of Environment work with local government to develop alternative methods of handling woodwaste from demolition and land clearing wastes (eg. chipping and composting, etc.)

RECOMMENDATION 65: Page 124

The Ministry of Environment work closely with local government and private landfill operators to monitor the construction and composition of sites intended for future industrial development.

RECOMMENDATION 66: Page 124

The Ministry of Environment work closely with local government and the construction industry to reduce volumes of gypsum wallboard being disposed.

RECOMMENDATION 67: Page 125

The Ministry of Environment in conjunction with the federal Department of Fisheries and Oceans examine the problem of marine litter and adopt necessary measures to combat the problem.

FUNDING SOLID WASTE MANAGEMENT

RECOMMENDATION 68: Page 127

The Province adopt the polluter-pays-principle as its long-term approach to waste management.

RECOMMENDATION 69: Page 130

A provincial tipping fee surcharge of $0.50 per tonne be levied on all landfill and incinerator operators in British Columbia. The requirement for maintaining the surcharge is to be reviewed every five years.

RECOMMENDATION 70: Page 132

The Province implement product charge excise taxes on difficult to dispose of products and that the Ministry of Environment develop by January 1, 1990, a list of products to be taxed and the recommended tax level for each product.

RECOMMENDATION 71: Page 133

The Province examine the use of product charges to pay for the disposal of special wastes in British Columbia.

RECOMMENDATION 72: Page 135

The Ministry of Environment produce a review of municipal solid waste user charge options and encourage local governments to implement solid waste user fees wherever feasible.

RECOMMENDATION 73: Page 136

The Province make all municipal support program funding retroactive to January 1, 1988.

FINAL COMMENTS

RECOMMENDATION 74: Page 139

The public review process used in preparing recommendations to the Government on British Columbia's solid waste problems be an option to seek solutions to other environmental problems.

RECOMMENDATION 75: Page 140

Any future environmental task force consider including both political representations, preferably a member of the Legislative Assembly, and technical staff from the Ministry.

RECOMMENDATION 76: Page 140

The Ministry of Environment expeditiously prepare an action plan detailing how and when the Ministry will implement those recommendations of this report which are accepted by Government.

SECTION ONE

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

The Honourable Bruce Strachan, Minister of State for Cariboo and Minister Responsible for Environment, appointed the Task Force on Municipal Solid Waste Management on August 3, 1988, to conduct a review of municipal solid waste management practices in British Columbia. The Terms of Reference (see appendix one) call on the Task Force to provide adequate opportunities for local governments, industry, organizations and individuals to participate in the development of a provincial strategy for municipal solid waste management.

More specifically, the Task Force mandate was to:

1. Review municipal solid waste management issues and concerns in British Columbia;
2. Determine the suitability of a range of alternatives to landfill disposal of municipal solid wastes, including: recycling, composting and energy and resource recovery;
3. Determine administrative and funding requirements to support these alternatives;
4. Submit its recommendations for a provincial municipal solid waste management strategy in a written report to the Minister of Environment on or before February 1, 1989.

1.2 THE TASK FORCE

The Task Force appointed by the Minister of Environment consisted of:

James T. Rabbitt, MLA Chairman. Mr. Rabbitt is the MLA for the riding of Yale-Lillooet and Parliamentary Secretary to the Minister Responsible for Environment. Prior to his election as an MLA, Mr. Rabbitt had served as

Mayor and Alderman for the City of Merritt and as a Director of the Thompson-Nicola Regional District.

Michael Stone, Member. Mr. Stone is an economist with the Planning and Assessment Branch of the Ministry of Environment.

David Douglas, Member. Mr. Douglas is a professional engineer with the Waste Management Branch of the Ministry of Environment.

Robert Williams, Public Co-ordinator. Mr. Williams is a public involvement co-ordinator with the Public Affairs and Communications Branch of the Ministry of Environment.

1.3 THE MINISTRY OF ENVIRONMENT'S DISCUSSION PAPER

In order to stimulate public discussion and participation in the Task Force's public review, the Ministry prepared and released a document entitled, "The Provincial Role in Municipal Solid Waste Management: A Discussion Paper". The discussion paper provided a summary of British Columbia's current solid waste management problems and contained 15 Ministry proposals for solving these problems. A press release, dated August 3, 1988, announced the appointment of the Task Force, the availability of the discussion paper and the commencement of a four-month period for public input.

Over 900 copies of the discussion paper were mailed to local government, waste management companies, recyclers, environmental interest groups and individuals known to be concerned about solid waste management. Additional hundreds of copies were distributed during the review process by mail and at public meetings.

Three background reports undertaken in preparation of the Ministry's discussion paper were also available to the Task Force and the public. These papers are:

Report of the 1986 Municipal Solid Waste Management Survey - This report provided estimates of the total quantity of municipal solid wastes generated in the province, the expenditures by local governments on solid waste management and a review of municipal management practices.

A Review of Municipal Solid Waste Management Programs in Selected Canadian Provinces and U.S. States - This report reviewed programs developed in other jurisdictions to assist in managing their solid waste problems.

A Review of the British Columbia Litter Act - This report reviewed and assessed British Columbia's Litter Act with particular emphasis on the Act's provisions for the control of beverage containers.

1.4 ENCOURAGING PUBLIC PARTICIPATION

Public participation in the Task Force's review process was encouraged in several ways including:

* A series of media releases throughout the public review:
  - "Discussion Invited on Solid Waste Proposals" - August 3
  - Press Advisory: Vancouver Sites Visit - September 9
  - "Solid Waste Task Force Meetings Set" - September 14
  - "Garbage Task Force to Visit Powell River" - October 24
  - Press Advisory: Public Meetings on Garbage - October 28;
* Paid advertising in community newspapers;
* Public service announcements on radio and cable television during October and November;
* Community newspaper feature articles
  - "Solid Waste Strategy Sought" - August 25
  - "Solving the Solid Waste Problem" - August 25
* Knowledge Network broadcast (October 6 and 30 - Garbage is Resourceful);
* Media interviews throughout the review process;
* A display at the Union of British Columbia Municipalities' annual convention (Whistler, B.C. - September 20-23).

1.5 THE PUBLIC REVIEW PROCESS

The public review process began with presentations made at the Union of British Columbia Municipalities' annual convention held at Whistler, B.C., September 20-23, 1988. This was followed by a series of 19 public meetings held during October and November, 1988, in 18 different communities across the province (see Appendix 2). In total, over 580 people attended these meetings and 71 formal presentations were made; in addition, a great deal of informal discussions were held. During this period, the Task Force also held special sessions with local governments, industry and special interest groups for detailed discussion of specific aspects of solid waste management. In total, 61 special sessions were held in 16 communities.

In addition to the public meetings and special sessions, the Task Force received a great deal of correspondence from the public. Over 120 supplementary briefs were received over the period August through December 1988 (see Appendix 3).

During the public review process, the Task Force had the opportunity to visit solid waste management facilities throughout British Columbia, including landfill sites, incinerators, transfer stations, recycling operations, and industrial operations which reprocess recycled goods. The Task Force also met with local and provincial government officials responsible for solid waste management. In addition to maintaining ongoing contact between the Task Force and waste management officials in other jurisdictions, Mr. Rabbitt had the opportunity to visit solid waste management facilities in Toronto, Ontario.

The Task Force was gratified by the public interest and response shown during the review process. Many excellent ideas and suggestions came forward from across the province which made the review process a most worthwhile exercise. The Task Force wishes to express their sincere thanks to all those who attended the public meetings or took the time to write in their comments. The Task Force has taken some pains in attempting to record as many of these views as possible into the report. If any participants reading the report fail to see their views acknowledged, the

Task Force claims the February 1, 1989, deadline as an excuse and asks for the readers' understanding.

1.6 BRITISH COLUMBIA'S MUNICIPAL SOLID WASTE PROBLEMS

It is estimated that during 1986, British Columbian's produced 2,130,164 tons of municipal solid wastes (Stone, 1988a). By the end of 1989, the annual production rate should be over 2.2 million tons and growing. This means that each man, woman and child in the province is generating on average almost three quarters of a ton of refuse annually or 2.02 kg per person per day. The study which produced these estimates defined municipal solid wastes as any solid wastes which enter either the collection or disposal systems operated by municipalities or regional districts in British Columbia. This definition would exclude any solid waste materials recycled, and more importantly, any commercial/industrial wastes that are disposed of on site or at a private disposal facility. For example, our province's wood industries generate vast quantities of wood wastes, much of which is used as fuel or incinerated on site. Thus, the estimates of municipal solid waste productions given above should be treated as a conservative estimate of the province's total waste management problem.

Figure 1-1 shows forecasts of the potential growth in British Columbia's municipal solid wastes over the next twenty years. The forecasts shown in the lower line are based on population increases alone, assuming a constant per capita waste generation rate. However, factors such as changes in consumer product packaging, changes in society's attitudes towards its waste production or changes in household income could result in increases or decreases in the per capita generation rate which would dramatically alter the provincial forecasts. For example, a U.S. study estimated that a 10 percent increase in household income results in a 5 percent increase in household solid waste production (Werty, 1976). If this result holds true for British Columbia, and if we assume that real household income in the province increases at an annual rate of 2 percent, then the potential effect of rising income on provincial solid waste production is shown in the upper line of Figure 1-1.

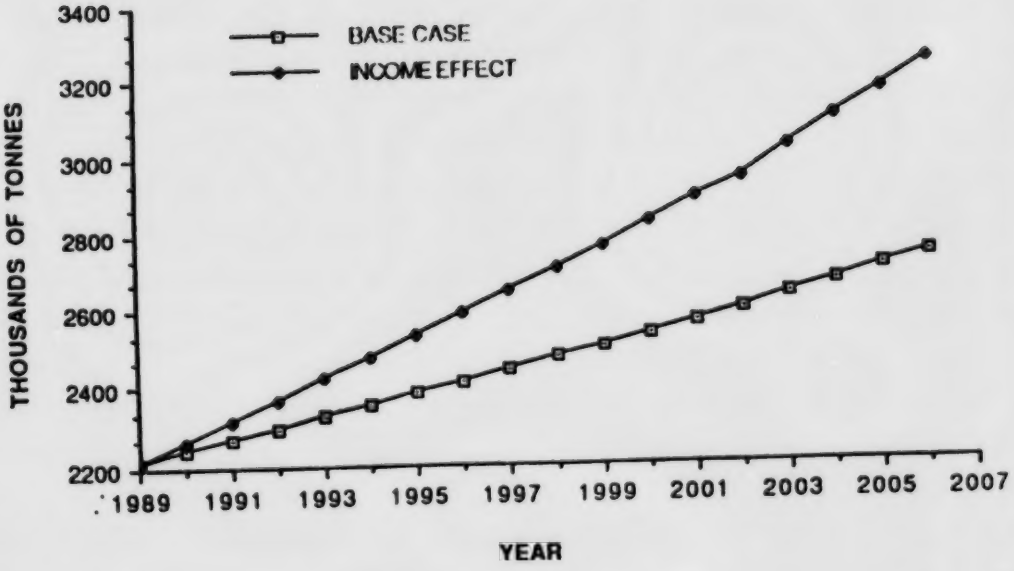

FIGURE 1-1

FORECASTED GROWTH IN MUNICIPAL SOLID WASTES

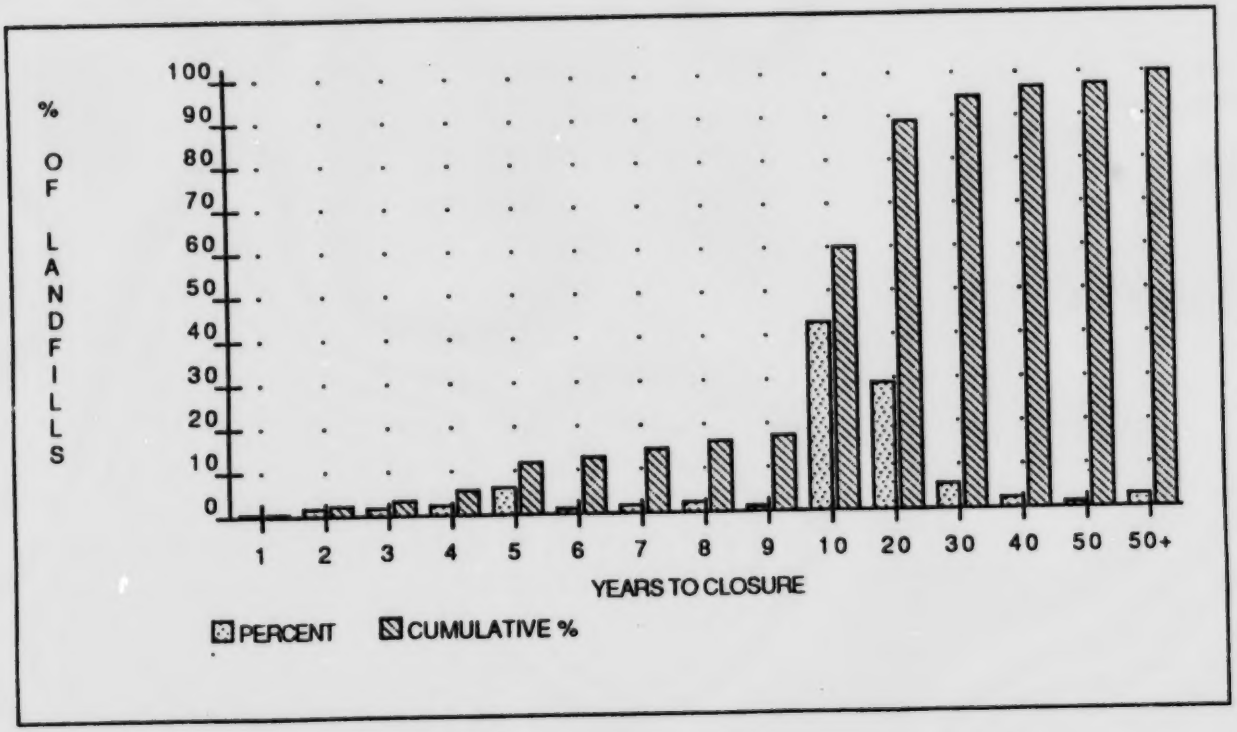

FIGURE 1-2

REMAINING SERVICE LIFE AT BRITISH COLUMBIA'S EXISTING LANDFILL SITES, 1988

CURRENT SOLID WASTE DISPOSAL PRACTICES

Virtually all, 99 percent, of the municipal solid wastes produced in British Columbia during 1986 were disposed of by landfill (Stone, 1988a). Seven municipalities operated small-scale incinerators that year which processed less than one percent of the wastes. A small residual of less than one percent was disposed of by recycling or composting. There has, however, been some recent changes in the province's disposal practices. In 1988, the Greater Vancouver Regional District (GVRD) opened its new mass-burn incinerator in Burnaby and its resource recovery plant in Coquitlam. The Burnaby plant processed 235,000 tons of wastes during 1988, which represents approximately 10 percent of the province's total solid waste production. The plant also produces steam energy which it sells to a neighbouring paperboard plant. The Coquitlam resource recovery plant will process 225,000 tons of commercial wastes of which 10 to 50 percent of the throughput will be recovered with the remainder going to landfill. In addition, more municipalities, such as Delta, are turning to household recycling programs as a waste disposal option. Nevertheless, unless major changes occur, the majority of the solid wastes produced in British Columbia will continue to be disposed of by landfill for the foreseeable future.

BRITISH COLUMBIA'S LANDFILLS

Currently, there are 236 licenced landfill sites in British Columbia with a permitted disposal rate of 3,707 tons or 8,215 cubic meters per day. Figure 1-2 shows a frequency distribution of the expected remaining service life of the landfills as reported on the permit applications. The figure shows the service life remaining along the side by year group and the percent and cumulative percent of total landfills in each year group along the bottom. As shown, 60 percent of licenced landfill sites will reach the end of their expected service lives in the next ten years. Thus, while we continue to rely on landfills for our waste disposal needs, the province may soon be running short of them.

MUNICIPAL SOLID WASTE MANAGEMENT COSTS

Local governments spent over $52.6 million to manage their solid wastes during 1986 (Stone, 1988a). The costs of collecting the wastes represents 61 percent of the total; landfilling and incineration accounted for 38 percent and only one percent was devoted to recycling. Table 1-1 presents examples of solid waste collection and disposal costs for the British Columbian communities. The individual community costs vary widely around the provincial average shown at the bottom of the table.

As great as the costs given above may seem, they unfortunately underestimate the true costs of solid waste management in British Columbia. Most communities do not have a full cost accounting system to record their waste management costs. Instead, they typically include only operational costs. This is particularly true for their waste disposal costs. For example, the 1986 survey of municipal solid waste management asked local governments operating landfills to indicate from a list of cost items which costs were included in their estimate of total landfill disposal costs. The results given in Table 1-2 shows that most operators, but still not all, include operational costs such as salaries, insurance and administration but few include methane gas collection or landfill site closure and post-closure costs.

The lack of full cost accounting for waste disposal has significant implications for solid waste management in the province. By underestimating the true costs of landfilling or incineration, the selection of waste disposal methods is biased against alternatives, such as recycling, composting, or resource recovery. Unquestionably, the growing public concerns over the environmental safety of landfills and incinerators will lead to increasingly stricter environmental safeguard requirements which will make these disposal options even more costly. At the same time, local governments are finding it increasingly more difficult to site new landfill sites which are publicly acceptable. For example, the Greater Vancouver, Capital and Nanaimo Regional Districts were all unable to find new publicly acceptable landfill sites within their own jurisdictions. This difficulty

TABLE 1-1

EXAMPLES OF COMMUNITY SOLID WASTE COLLECTION AND DISPOSAL COSTS, 1986

COMMUNITY	COLLECTION COSTS		DISPOSAL COSTS	TOTAL
	($ Household)	($/Tonne)	($/Tonne)	($/Tonne)
Vancouver	69.00	57.14	6.60	63.74
North Vancouver	58.72	35.59	20.00	55.59
Nanaimo	37.14	67.32	13.88	81.20
Prince George	25.80	18.27	3.27	21.54
Kamloops	38.38	35.53	11.35	46.88
Prince Rupert	132.47	29.40	14.77	44.17
Powell River	40.20	16.08	15.00	31.08
Dawson Creek	75.69	10.86	4.68	15.54
Hope	93.60	58.50	15.88	74.38
Port McNeill	46.59	31.53	18.00	49.53
B.C. Average	N/A	24.08	8.98	33.06

Source: Stone, 1988a.

TABLE 1-2
COST ITEMS INCLUDED BY LOCAL GOVERNMENTS IN DETERMINING THEIR LANDFILL DISPOSAL COSTS, 1986

LANDFILL DISPOSAL COST ITEM	PERCENTAGE OF OPERATORS INCLUDING THE COST ITEM (%)	PERCENTAGE OF OPERATORS NOT INCLUDING THE COST ITEM (%)
Salaries and Benefits	89	11
Worker's Compensation	82	18
Land Purchase and Preparation	55	45
Gas Collection and Control	30	70
Leachate Control	45	55
Capital Equipment	55	45
Interest Payments	34	66
Engineering Costs	53	47
Closure and Post-Closure Costs	34	66
Buildings and Security	53	47
Insurance	74	26
Administration	68	32

Source: Stone, 1988a.

with locating new sites should mean that existing landfill space is a scarce resource worth conserving.

DISPOSAL ALTERNATIVES

In order to understand the available disposal alternatives to landfills and incinerators, requires a knowledge of the material composition of municipal solid wastes. Unfortunately, a recent study of the material composition of British Columbia's solid wastes is not available. However, a 1976 study of B.C.'s solid wastes as well as a 1986 study of the province's southern neighbour, Washington State, are available; the results of which are shown in Figure 1-3 (Bird and Hale Ltd. et al, 1979 and Matrix Management Group et al, 1987, respectively).

The figure gives the percentage breakdown of total solid wastes from the two studies by six material components. The results of the two studies are quite similar, however, plastics had a much higher share of the waste stream in the Washington study. It is expected that with the continuing growth in the use of plastics in consumer products packaging that the current share of plastics in the B.C. waste stream will be similar to that shown in the Washington State study.

Much of the materials contained in the solid waste stream shown in Figure 1-3 could be recycled, recovered or composted. Recycling refers to the at-source separation of recyclable materials by households or businesses prior to the materials entering the waste collection and disposal system. Recovery refers to the extraction of useful materials from the waste stream after waste collection has taken place. Composting refers to the natural process by which micro-organisms decompose organic material. The potential each of these disposal alternatives have for reducing the province's dependency on landfills and the means by which the use of these alternatives can be encouraged is discussed in the remainder of this report.

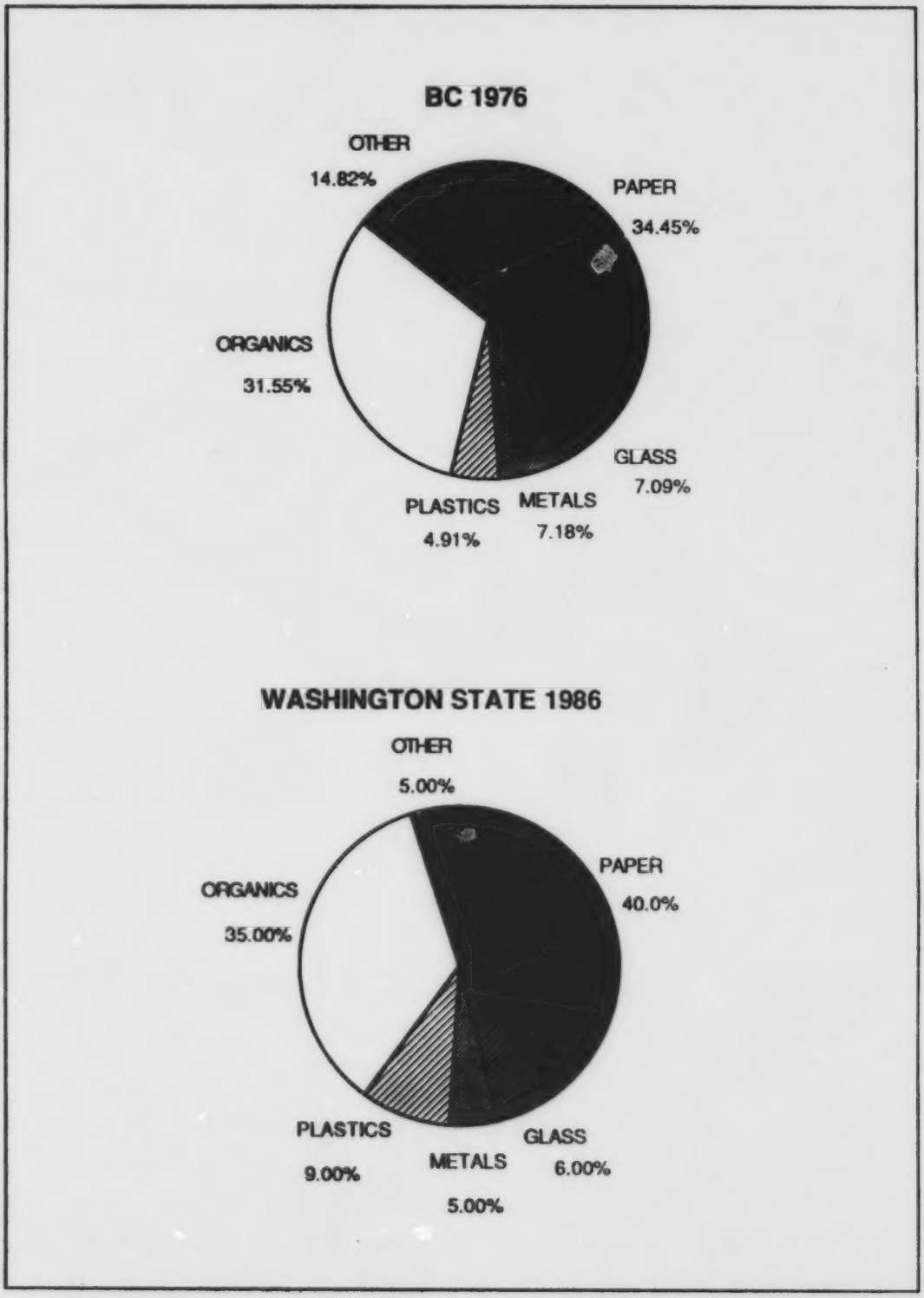

FIGURE 1-3
MATERIAL COMPOSITION OF MUNICIPAL SOLID WASTES

SECTION TWO

SOLID WASTE PLANNING AND MANAGEMENT

2.1 INTRODUCTION

Good management starts with good planning and this is no less true for solid waste management. This section will deal with ways by which the Province can establish and assist a planning process for the management of local solid waste problems. It starts with a review of the principles and goals of solid waste management, moves through the requirement for local waste planning and makes recommendations for provincial assistance to local governments undertaking solid waste management plans.

Underlying the recommendations of this section is the Task Force belief that while the setting, monitoring and enforcement of environmental standards is a Provincial responsibility, the actual planning and implementation of solid waste management practices within these standards is a local government responsibility. Local governments have a better understanding of local conditions, requirements and attitudes which vary widely across the province than would a central bureaucracy.

2.2 SOLID WASTE MANAGEMENT PRINCIPLES AND GOALS

During the Task Force's public meetings held across the province, a great deal of discussion was directed at the underlying principles and goals the province should adopt in order to solve the province's solid waste management problems (20, 74, 75, 76, 77, 88, 92, 106, 132, 137, 147, 261). The discussion of waste management principles centered around ways by which the volumes of wastes society produces could be minimized before waste disposal is required. The discussion of waste management goals focussed on the establishment of specific goals for the diversion of materials from the waste stream by recycling and composting.

MANAGEMENT PRINCIPLES

The majority of the briefs received by the Task Force stressed the need for society to focus its waste management efforts on ways which minimize the volume of materials requiring waste disposal. The principles by which waste production can be minimized can be succinctly stated as the 4 R's: reduce, re-use, recycle and recover.

1. **Reduce** - Society can reduce the production of waste materials by better product design which allows for its re-use or easy recyclability and by the elimination of unnecessary packaging materials. Consumers can actively stimulate this behaviour by selecting products which display these characteristics.

2. **Re-use** - The repeated use of a product in the same form and usually for the same purpose will also serve to minimize waste production. An example of this activity is the use of refillable bottles in the soft-drink and brewing industry.

3. **Recycle** - Society can recycle the material contents of products at the end of their service life which are about to enter the waste stream.

4. **Recover** - After the wastes have been collected, society can attempt to recover useful materials and energy from the wastes prior to their ultimate disposal.

Several briefs noted correctly that the 4 R's will not be enough (74, 130). After society reduces, re-uses, recycles and recovers, there will be a residual quantity left for disposal. Thus, the fifth R is **Residual Management** - the environmentally safe disposal of the materials left in the solid waste stream.

Neither the Ministry of Environment's discussion paper nor other Ministry documents explicitly accept the 5 R's listed above as the

Province's policy and priorities in solid waste management. The Task Force believes that the 5 R's provide an environmentally sound and socially desirable approach to solid waste management and encourages the Province to adopt them as its policy and priorities.

RECOMMENDATION 1:

That the Government adopt as its policy and priority in solid waste management the 5 R's - reduce, reuse, recycle, recover and residual management.

MANAGEMENT GOALS

Several briefs suggested that specific solid waste management goals are necessary in the planning process especially a goal for recycling (23, 74, 75, 76, 132, 137). The suggested goals for reducing solid waste production in British Columbia by recycling included 25% (74, 75, 76, 132), 50% (137), 75% (23) and 80% (9). In its discussion paper the Ministry of Environment stated that a realistic five year goal for reducing wastes by recycling would be 25% and that a further 10% reduction could be possible by the composting of leaf and yard wastes.

The Task Force believes that the setting of recycling and composting goals would provide useful yardsticks with which to measure the future success of solid waste management in British Columbia. In addition the Task Force believes that the goals proposed by the Ministry of Environment in its discussion paper are realistic ones. However, the setting of goals must not be viewed as setting limits. Communities that reach or exceed the goals should not stop there but instead continue their efforts as long as they are economically efficient. Also, communities which cannot reach the goals due to their own unique circumstances yet are doing all that could be reasonably expected of them to reach the goals should not be viewed as failures. Finally, the goals should not be static and unchanging. Instead they should be regularly reviewed and updated.

RECOMMENDATION 2:

The Government set a five year provincial goal of reducing the municipal solid waste stream by a minimum of 25% through recycling and by a further 10% at least through the composting of leaf and yard wastes plus backyard composting of household organics.

2.3 SOLID WASTE MANAGEMENT PLANNING

The Waste Management Act of 1982 contained provisions which allow local governments to undertake Waste Management Plans. By undertaking such a plan, local governments can seek authorization for all of its waste discharges rather than requiring a permit for each individual discharge source. A plan may include refuse, sewage and air emissions together or separately. The plans do not cover the industrial discharges within the local government's jurisdiction. Instead, industries must apply for their own discharge permits. The completed plans require the approval of the Minister of Environment and the Minister of Municipal Affairs, Recreation and Culture before discharges will be authorized.

Solid waste management plans have been developed by the Greater Vancouver, Capital and Nanaimo Regional Districts. Solid waste plans are currently being developed in the Regional District of Kootenay Boundary and the District of Powell River.

The major advantage of waste management plans to local governments, besides the consolidation of discharge permits, is that it allows them to take into account their present and future environmental, land-use and financial needs for managing their wastes. In addition, technical assistance from provincial staff is available to the local government in preparing the plan. The Waste Management Act also requires that adequate public consultation be undertaken by the local government before the plan is approved.

The Task Force believes that the conduct of solid waste management plans is an excellent means by which local governments can assess and prepare for their long-term solid waste disposal requirements. Furthermore, the Task Force believes that such plans should be prepared for the entire province, preferably at the regional district level, within the next five years.

RECOMMENDATION 3:

All regional districts be required to prepare Solid Waste Management Plans by December 31, 1994. Any municipalities not covered by a regional district plan are to prepare their own plan by that date.

If the province is going to require local governments to undertake solid waste management plans then it would seem reasonable for the Province to provide some financial assistance. The Ministry's discussion paper did contain a proposal to provide municipal waste management planning grants. Not surprisingly, this proposal was strongly endorsed by local governments (2,9, 12, 13, 20, 30, 33, 55, 62, 98, 110, 245, 249, 253, 260, 267). This would not be without precedence. For example, the Revenue Sharing Act includes provisions for sewer and water system study grants of $5,000 plus 50% of the next $10,000 of approved costs. The Task Force believes that it would be reasonable for the Province to provide similar funding to the study of municipal solid waste problems.

RECOMMENDATION 4:

That Solid Waste Management Planning Grants of $5,000 plus 50% of the next $10,000 to a maximum of $10,000 per applicant, be given to regional districts and municipalities undertaking Solid Waste Management Plans, and that regional districts be eligible for a similar grant for each municipality included within its plan.

2.4 ASSISTING THE PLANNING PROCESS

Sound decisions in solid waste management will only occur if the decision makers have sound information on their solid waste management options. Currently local governments must individually gather this information which can be a time consuming process. If instead this information was gathered centrally for distribution to local governments it would be of great assistance to the planning process and fully exploit the economies of scale in gathering the information. This would allow local governments to concentrate their efforts on solving their local solid waste management problems.

THE MINISTRY'S PROPOSAL

The Ministry of Environment recognized, in its discussion paper, the need to provide local governments with more information on solid waste management options. The paper proposed that the Ministry conduct the five following research studies:

a) estimation of the true cost of landfills for representative B.C. communities,

b) estimation of the current material composition of the residential and commercial/industrial waste streams,

c) development of procedures to estimate waste volumes at sites too small for weigh scales,

d) a study of the role consumer packaging plays in the production of solid wastes, and

e) the development of a recycling data base containing the quantity, costs, prices and markets for recyclable materials.

Generally, the public response to the Ministry's proposal was supportive (36, 45, 65, 74, 75, 76, 80, 81, 92, 106, 130). Municipal

support for the proposal was also strong (33, 39, 62, 98, 110, 149, 248, 254, 261, 266, 271). However, some thought that the list of required studies was incomplete suggesting that the following studies should be added:

a) estimation of the true cost of incineration for representative B.C. communities (45, 74, 75, 76),

b) estimation of the costs of rural transfer stations (39, 45),

c) preparation of a manual of office paper recovery (74), and

d) a study of the environmental consequences of bio-degradable and photo-degradable plastics (130).

RECOMMENDATION

The Task Force agrees that centralized collection of information and conduct of research on solid waste management options for dissemination to local governments would be of great assistance to the solid waste management process. In addition the Task Force believes that both the studies recommended by the Ministry and the additional studies recommended by the public should be undertaken. However, the first priority for the Ministry of Environment should be to review and update the municipal waste disposal objectives under the Waste Management Act for landfills and incinerators. The update should contain the necessary environmental safeguards and standards required to take the province into the next century.

RECOMMENDATION 5:

In order to provide local government with the information required to conduct Solid Waste Management Plans the Ministry of Environment conduct the following studies:

a) A review and update of the provincial municipal objectives for landfills and incinerators.

b) The estimation for representative communities in British Columbia of the true cost of landfills including capital, operating, closure, post-closure, and environmental costs.

c) The estimation of the true costs of incineration for a representative sample of communities including capital, operating, ash disposal and environmental costs.

d) The estimation of the current material composition by weight and by volume of the municipal solid waste stream, as separated into residential and commercial/industrial wastes. This study should be repeated every five years to identify any emerging trends.

e) The development of procedures to estimate the volumes of wastes being disposed of at smaller landfill sites, where the weighing of the wastes is impractical.

f) The development of municipal recycling and composting manuals which detail the methods, equipment, personnel and costs of implementing various municipal recycling and composting options.

g) A review of rural solid waste transfer station options including their design, operation and costs.

h) The development of an office waste paper recovery manual for use by government, institutions and businesses.

i) A review of methods for collecting recyclable materials from apartments and commercial buildings.

j) A study of consumer product packaging as a component of the solid waste stream and the options available for reducing its volume.

k) The development of a data base on recyclable material markets, prices and quantities recovered. The data base is to be updated annually.

1) A study of the environmental impacts of degradable plastics both photo and bio-degradable.

CONTINUING SOLID WASTE MANAGEMENT RESEARCH

The completion of the research studies listed above should provide local governments with a solid foundation from which to begin their solid waste management planning. However, it would seem advisable to also provide some mechanism for continuing research on British Columbia's solid waste management problems. To this end it would appear that British Columbia's three major universities would be the ideal vehicle for continuing research in this area. The use of universities to conduct research on solid waste management issues is not uncommon in other jurisdictions. For example, a recent survey of U.S. universities found that 54 institutions were offering courses, programs or conducting research on solid waste management issues (Jantzef, 1988).

The Task Force believes that the time has come to establish a formal solid waste research link with the province's universities. This could be accomplished by the Province establishing research fellowships at these institutions.

RECOMMENDATION 6:

The Province establish through the Ministry of Advanced Education and Job Training one or more faculty research fellowships at British Columbia's universities to conduct research into solid waste management and disposal methods.

2.5 PROVINCIAL STAFFING NEEDS

The development of new provincial solid waste management policies, priorities and programs brings with it a requirement to review the provincial staffing levels needed to implement and administer these new policies and programs. Currently the issuing of solid waste disposal permits plus the monitoring and enforcement of provincial disposal

guidelines is the responsibility of the regional waste management staff. The regional staff have the same responsibilities with regard to permitting and monitoring of both industrial and municipal effluent and air emissions. Regional staff can also call on the Technical Services Section of the Waste Management Branch in Victoria for some assistance.

Previously the responsibility for promotion of recycling and other alternatives to landfilling and incineration was carried out by the Resource Recovery Section of the Waste Management Branch's Victoria headquarters. This section had a staff of nine; a manager, two engineers, four technicians and two co-op students. In 1984 the section was cut to two positions and became part of a solid waste section. Subsequently this section was further cut and amalgamated with the Technical Services Section. Currently, recycling and resource recovery is handled part-time by one person.

COMPARISONS TO STAFFING IN OTHER JURISDICTIONS

Washington State, with a population of 4.4 million, has 89 full-time equivalent positions in its solid/hazardous waste management program (Washington State, 1987). Ontario, with a population of 9 million, has 80 people employed in the solid waste management program of the Ministry of the Environment, of which 35 are located at their headquarters. Oregon, with a population of 2 million, has three positions for its waste reduction and recycling function and a further four positions in its other solid waste management functions. In California, with a population of 26 million, the California Waste Management Board has 60-65 positions in its solid waste management program and the Department of Conservation is filling 100 positions to administer their new Beverage Container Act.

THE MINISTRY'S PROPOSAL

In its discussion paper the Ministry of Environment proposed the establishment of a Recycling and Solid Waste Management Section within the Waste Management Branch headquarters in order to implement and administer commercial/industrial recycling coordinator, a grant administrator and a clerk. The discussion paper stated that these positions would not be new

full-time equivalent positions but instead would come from a reallocation of vacant positions.

The public comments received on the Ministry's proposal were generally favourable (16, 35, 39, 45, 74, 75, 76, 81, 92, 98, 137, 149, 248, 254, 266, 271). However, there was some concern expressed that five positions would be insufficient (16, 75, 76). In addition, the opinion was expressed that the positions should be new positions and that all personnel selected to fill these positions be fully qualified in recycling and resource recovery (74, 75, 76, 81, 248). There was one suggestion that instead of a new section in the Waste Management Branch that the Province establish a Provincial Recycling Institute to undertake these functions (26).

RECOMMENDATION

The Task Force does not believe that current staffing levels of the Waste Management Branch are sufficient to undertake the new programs recommended in this paper. The Task Force agrees with the Ministry of Environment's proposal to recreate a Solid Waste Management and Recycling Section within the Waste Management Branch. The major function of this section would be to act as a resource and technical support center for both regional waste management staff and local governments. In addition to the positions proposed by the Ministry, the Task Force believes that two further functions will be required. One to assist with the coordination of recyclable materials marketing and a solid waste disposal specialist. The personnel selected for these positions must be fully qualified in solid waste management and recycling practices rather than a simple reassignment of existing personnel. The Task Force, however, intends that the Ministry be afforded the necessary flexibility to allocate an adequate level of total staffing to perform the functions in the headquarter unit as well as in the regional establishment, if appropriate.

RECOMMENDATION 7:

The Ministry of Environment establish a Solid Waste Management and Recycling Section within the Waste Management Branch. The section is to include the following functions:

a) Management
b) Municipal Recycling Coordination
c) Commercial/Industrial Recycling Coordination
d) Recyclable Material Market Coordination
e) Grant Administration
f) Solid Waste Disposal Engineering
g) Administrative Support

The establishment of positions will need to be phased with the program implementation and adequate personnel allotments introduced to each function as determined necessary by the Ministry of Environment.

2.6 CONTINUING PUBLIC INVOLVEMENT

As noted earlier the Task Force received a wealth of ideas, comments and suggestions from municipal leaders, recyclers, businesses, and the general public at the public meetings and from written submissions. Many of the participants expressed a desire that the involvement of the public in solid waste management be a continuing process. Several suggestions were received that some form of a public advisory committee reporting to the Minister of Environment on solid waste management and recycling issues be formed (23, 74, 75, 76, 90, 92, 261). It was recommended that representatives of local governments, recyclers, interest groups and business be appointed to such a committee.

The establishment of ongoing environmental advisory committees is not without precedent in other jurisdictions. For example, in Alberta the Environmental Council of Alberta provides their provincial government with ongoing advice and research on environmental issues. The Council has recently undertaken a review of waste recycling in Alberta (Environmental Council of Alberta, 1987). In Ontario the Minister of Environment has established a Recycling Advisory Committee.

RECOMMENDATION 8:

The Minister of Environment establish, and appoint people to, a Municipal Solid Waste and Recycling Advisory Committee. Members should be appointed from local governments, recyclers, industry, consumer groups and the general public. The advisory committee should then develop sub-committees to address municipal issues, recycling, packaging and litter control.

2.7 MUNICIPAL POWERS

Several issues concerning municipal powers and the relationship between local governments and the Province were raised during the Task Force's meetings with local governments.

Of the province's 28 regional districts, 7 have complete responsibility for refuse disposal in all areas of their regional districts, 16 for parts of their regional districts, usually the rural areas, and 5 have no refuse disposal function (Ministry of Municipal Affairs, 1988). The Task Force believes that, in most cases, solid waste disposal can best be managed at the regional district level.

RECOMMENDATION 9:

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to make solid waste disposal a regional district function.

A commonly voiced complaint from local governments in rural areas was the cumbersome provision of the Municipal Act which requires a referendum be held if the costs of the necessary solid waste programs exceed the maximum allowable mil rate levy (8, 19, 46). The Task Force believes that environmentally sound solid waste management programs are a social necessity for all areas of the province and that the referendum requirement should be done away with.

RECOMMENDATION 10:

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to remove the limitations on local governments in raising revenues for solid waste disposal.

Local governments also commented that they are prevented under the Municipal Act from establishing accumulative reserve funds to off-set future capital expenses (19, 39). This becomes an important issue in the long-term planning of waste disposal facilities either with the refurbishment of incinerators or the conduct of closure and post-closure maintenance of landfills. The Task Force believes that local governments should maintain capital reserve funds for all waste disposal facilities. The establishment of reserve funds also forces local governments to recognize the added long-term costs of disposal facilities while these facilities are still in use.

RECOMMENDATION 11:

The Ministry of Municipal Affairs, Recreation and Culture amend the Municipal Act to require local governments with a solid waste disposal function to establish a capital reserve to pay for the long-term environmental costs of solid waste disposal facilities including incineration refurbishment and landfill closure and post-closure.

Some local governments complained that Provincial Ministries or Agencies received free use of local waste disposal facilities (31, 49). The Task Force believes that it is important for all Provincial Ministries and Agencies to set an example in solid waste management by paying for their use of any local waste disposal facilities. As will be seen, this is very important in light of recommendations made in Section 12 on the funding of solid waste management.

RECOMMENDATION 12:

The Government direct all provincial Ministries, agencies and Crown corporations which use local government waste disposal facilities to pay for their use of those facilities. The payment may be made in either cash or in kind.

The Task Force noted in their discussions with regional waste management staff of the Ministry of Environment, the cooperative approach regional staff have tried to use when dealing with municipal waste disposal facilities which are not in compliance with their permits (1, 7, 18, 29, 45, 61, 122). The Task Force believes that this is a sound approach whenever the local government is attempting to make corrections. However, where cooperation is not received by local governments, the Ministry of Environment should strictly enforce the permit requirements.

RECOMMENDATION 13:

The Ministry of Environment should continue in its cooperative approach in assisting municipal permittees who are not operating in compliance with their discharge permit where the permittee is working to correct the problem. However, the Ministry should strictly enforce the permit requirements where corrective actions are not taking place.

SECTION THREE

MUNICIPAL RECYCLING AND COMPOSTING

3.1 INTRODUCTION

This section will be devoted to municipal recycling and composting programs; what they are, what they can accomplish and what can be done to assist them. In particular this section will focus on at-source separation programs; that is, programs which separate recyclable material from the waste stream prior to the wastes being collected from the household or business. The recovery of materials from the waste stream or the composting of mixed wastes after the wastes have been collected from the household are discussed in Section Six. In addition to residential recycling a discussion of recycling in government and in business is included as is a discussion of the importance of information to recycling and other recycling issues.

3.2 BACKGROUND

A brief review of the potential inherent in municipal recycling and composting as waste disposal alternatives plus examples of existing programs operating in north american communities is essential at this point. First municipal recycling programs will be reviewed followed by municipal composting programs.

MUNICIPAL RECYCLING PROGRAMS

During this decade there has been a rapid expansion in the number of municipalities operating recycling programs. This is particularly true of the northeastern U.S. states and Ontario which have experienced severe waste disposal problems. Communities in these areas have turned to recycling in an attempt to divert as much material as possible from their solid waste stream. The programs they have established range from simple drop-off operations, where residents bring their sorted recyclable materials to

central drop-off bins, to the more sophisticated curbside pick-up programs. Most of these programs are aimed at serving residential single-family dwellings, however programs to serve apartment dwellers and businesses are also gaining in momentum.

Tables 3-1 and 3-2 summarize the results of 36 municipal curbside recycling programs from across north america (Snow and Johnson, 1988, Peters and Grogan, 1988, and Glenn, 1988a). Only three of the programs were single material newspaper pick-up programs. The remainder were multi-material programs collecting, in decreasing order of frequency, newspaper, glass, aluminum cans, tin cans, old corrugated cardboard, plastics, motor oil and mixed paper. Expressed as a percentage of total weight of the materials collected by multi-material programs newspaper accounts for 63-78% of total weight, glass 15-30% and aluminum <1-5% (Glenn, 1988a).

The overall public participation rate in these communities varied from 20-98%. However, not all participants put out material for collection on every collection day, therefore the reported collection day participation rates varied from 10-66%. Observers of recycling programs stress that the key to high a participation rate is to make it as convenient as possible for the public to participate. One way to do this is to ensure that the recyclable materials are collected on the same day as the regular trash is collected. This makes it easier for the public to remember when to put out the recyclable materials and they do not need to set out materials twice per collection period. Nineteen of the 36 communities shown provided collection on the same day as regular trash pick-up.

The provision of an in-house storage container for the recyclable material is the second way observers stress will increase public participation. The type of container provided varies from burlap or plastic bags to 20 gallon plastic tubs. Perhaps the most common container type is the famous 'Blue Box'. This is a bright blue coloured ten gallon plastic tub with the words 'WE RECYCLE' embossed in white on the sides. Over one million of these containers are currently in use in Ontario alone. It is said that the high visibility of these containers on collection days puts

TABLE 3-1
EXAMPLES OF MUNICIPAL CURBSIDE RECYCLING PROGRAMS IN NORTH AMERICA

COMMUNITY	POPULATION	HOUSEHOLDS SERVED	MATERIALS COLLECTED*	WEIGHT COLLECTED	WASTE STREAM REDUCTION
	(000's)	(000's)		(Tons)	(%)
Ann Arbour, MI	108.0	20.0	N,G,A,O	1,700	10.0(R)
Austin, TX	457.0	88.0	N,G,T,A	5,400	3.0
Barrington, RI	17.1	5.4	N,G,A	953	14.8
Boscobel, WI	2.7	1.0	N,G,A	66	20.0
Cheltenham, PA	35.5	9.5	N,G,A	-	-
Davis, CA	47.0	11.0	N,G,A,C	3,200	-
Dover, NH	15.0	4.0	N,G,A	846	6.5
Essex Co., NJ	850.0	-	N,G,A	100,000	15-20.0
Evesham, NJ	36.0	8.5	M,G,T,A	2,995	-
Groton, CT	10.0	1.9	N,G,T,A,C	626	-
Haddonfield, NH	12.5	4.4	N,G,T,A	1,500	-
Hamburg, NY	10.5	3.4	N,G,A,T,C,O	1,000	34.0(R)
Islip, NY	300.0	77.0	N,G,A,T,C	6,936	12.0
Kitchener, ONT	250.0	-	N,G,T,A,O	-	12.0(R)
Madison, WI	172.0	47.7	N	3,551	6.0
Marin Co., CA	-	44.0	N,G,T,A,P	12,500	22.0
Mecklenberg, NC	31.0	9.0	N,G,A,P	761	3.0
Minneapolis, MN	360.0	120.0	M,G,T,A	7,600	11.0
Mississauga, ONT	400.0	90.0	N,G,T,A	14,000	11.0(R)
Montclair, NJ	38.5	9.5	N,G,A	3,840	18.5
Niagara Falls, ONT	70.0	19.5	N,G,T,A,P	2,307	-
Palo Alto, CA	57.0	20.3	N,G,A,T	5,390	9.0
Plymouth, MN	43.0	12.5	N,G,T,A,C	2,800	-
Portland, OR	450.0	-	N,G,T,A,P	-	24.0
Prairie du Sac, WI	2.3	-	N,G,T,A,P,O	-	30-50.0
Rockford, IL	140.0	44.5	N,G,A	605	1.0
St. Cloud, MN	44.0	9.8	N,G,A	403	-
San Jose, CA	720.0	180.0	N,G,T,A,P	24,000	5.0
Seattle, WA	500.0	71.0	M,G,T,A	-	-
Somerset Co., NJ	81.0	-	-	-	23.0
Springfield, PA	22.0	6.8	N,G,A	1,972	-
Sunnyvale, CA	116.0	28.0	N,G,T,A,P,O	4,655	8.0
Upper Moreland, PA	28.0	6.2	N,G	-	-
W. Palm Beach, FL	68.0	16.5	N	1,052	9.0
Wilkes-Barre, PA	51.0	16.0	N	1,600	8.0
Wilton, NH	8.5	-	N,G,T,A,P	-	44.0

* N - Newspaper; M - Mixed Paper; G - Glass; T - Tin Cans; A - Aluminum Cans; C - Corrugated Cardboard; P - PET Plastic; O - Motor Oil; R - Residential Waste Stream

Source: Snow and Johnson (1988), Peters and Grogan (1988) and Glenn (1988a).

TABLE 3-2
CHARACTERISTICS OF MUNICIPAL CURBSIDE RECYCLING PROGRAMS IN NORTH AMERICA

PROGRAM	SERVICE OPERATOR	COLLECTION FREQUENCY	SAME DAY AS TRASH	CONTAINER PROVIDED	MANDATORY PROGRAM	PARTICIPATION RATE	
						OVERALL (%)	COLLECTION DAY (%)
Ann Arbour, MI	Con	B	Y	N	Vol	50	25
Austin, TX	Mun	W	N	N	Vol	20-25	10-12
Barrington, RI	Mun	M	Y	N	Vol	25-75	-
Boscobel, WI	Mun	B	N	N	Vol	60	-
Cheltenham, PA	Mun	W	Y	Y	Vol	40	30-35
Davis, CA	Con	W	Y	N	Vol	60	50
Dover, NH	Mun	B	Y	N	Vol	85	-
Essex Co., NJ	-	-	-	-	Vol	-	-
Evesham, NJ	Mun	W	N	Y	Man	85-90	50
Groton, CT	Mun	W	N	N	Man	75-85	50
Haddonfield, NH	Mun	W	Y	Y	Man	95	66
Hamburg, NY	Mun	W	Y	N	Man	98	-
Islip, NY	Both	W	N	Y	Man	80	-
Kitchener, ONT	Con	-	Y	Y	Vol	84	-
Madison, WI	Mun	W	Y	N	Man	73	-
Marin Co., CA	Con	W	Y	Y	Vol	60	35-40
Mecklenberg, NC	Mun	W	Y	Y	Vol	71	37
Minneapolis, MN	Con	B	N	N	Vol	25-30	15
Mississauga, ONT	Con	W	Y	Y	Vol	80	40
Montclair, NJ	Mun	B	N	N	Man	85	50
Niagara Falls, ONT	Con	W	Y	Y	Vol	75-80	45
Palo Alto, CA	Con	W	Y	Y	Vol	65	25
Plymouth, MN	Con	W	N	Y	Vol	-	53-65
Portland, OR	Con	-	-	-	Man	20	-
Prairie du Sac, WI	Con	-	-	-	Man	95	-
Rockford, IL	Con	W	Y	N	Vol	68	-
St. Cloud, MN	Mun	M	N	N	Man	-	30
San Jose, CA	Con	W	Y	Y	Vol	58	25
Seattle, WA	Con	W	N	Y	Vol	48	29
Somerset Co., NJ	-	-	-	Y	Vol	-	-
Springfield, PA	Mun	W	Y	Y	Vol	70	60
Sunnyvale, CA	Mun	W	Y	Y	Vol	50-60	21
Upper Moreland, PA	Mun	W	Y	Y	Man	62	50
W. Palm Beach, FL	Mun	W	N	N	Vol	30	-
Wilkes-Barre, PA	Mun	W	N	N	Man	47	-
Wilton, NH	-	-	-	-	Man	65	-

Mun - Municipal
Con - Contract

W - Weekly
B - Biweekly
M - Monthly

Man - Mandatory
Vol - Voluntary

Source: Snow and Johnson (1988), Peters and Grogan (1988) and Glenn (1988a).

TABLE 3-3

INCREASED PARTICIPATION RATES DUE TO THE PROVISION OF HOUSEHOLD CONTAINERS

COMMUNITY	PARTICIPATION RATES	
	BEFORE	AFTER
	(%)	(%)
Champaign, IL	11	65
Kitchener, ONT	65	75
San Jose, CA	48	75
Santa Rosa, CA	35	70
Toronto, ONT	42	60

Source: Glass Packaging Institute, 1988.

TABLE 3-4

COMMUNITY RECYCLING PROGRAMS IN BRITISH COLUMBIA, 1986

JURISDICTION TYPE	HAD RECYCLING PROGRAMS	USED DEPOTS	TOTAL DEPOTS	USED CURBSIDE COLLECTION	TOTAL HOUSEHOLDS SERVED
Regional District	4	3	17	1	5,000
City	12	7	21	7	22,261
District Municipality	13	10	137	6	126,416
Town	2	2	2	0	0
Village	0	0	0	0	0
TOTAL	31	22	177	14	153,677

Source: Stone, 1988a.

peer pressure on households to participate. The effect of the provision of household containers on participation rates is shown in Table 3-3. Participation rose by between 10-54% in the five communities surveyed after containers were provided.

In 13 of the communities surveyed, recycling has been made mandatory by state or local ordinances. The effect of requiring the public to participate is not clear. Participation rates in mandatory programs varied from 20-98% while participation in voluntary programs varied from 20-95%. It would appear that well thought out voluntary programs can achieve the same results as mandatory programs.

If all of the paper, glass, metal and plastic materials in the municipal waste stream could be recovered by source-separation recycling programs then approximately 60% of the waste stream could be recovered by recycling (see Figure 1-3). However, it would be unrealistic to expect that all materials could be separated out. The reductions in the solid waste stream achieved by the recycling programs listed in Table 3-1 varied from a low of 1% to a high of 44% with reduction rates of 20% or more not uncommon. The three single material newspaper pick-up programs achieved waste reduction rates of 6-9% which is excellent given that old newspaper makes up only 6-11% of the total municipal solid waste stream.

Unfortunately the costs of running the recycling programs listed in Table 3-1 and the revenues recovered from the sale of the materials was unavailable. Instead, a 1985 survey of 45 municipal recycling programs in Pennsylvania can act as a guide (Hursh, 1986). This study found that the average cost of collection was $23.18/ton, including administration, public education and operating costs, while the average revenue received from the sale of the material was $18.49/ton. Thus, the recycling programs would be operating at a loss if they were run strictly as a commodity business. However, because these communities faced an average landfill tipping fee of $31.46/ton, the recycling programs, as a waste disposal option, had an average profit of $26.77/ton.

MUNICIPAL RECYCLING IN BRITISH COLUMBIA

While municipal recycling in British Columbia is growing there remains substantial room for growth. A 1986 survey of municipal solid waste management practices revealed that only 31 of the 172 regional districts and municipalities in the province reported the operation of a recycling program (see Table 3-4). Furthermore, only 14 of these programs ran curbside collection of recyclables with the remaining 17 operating drop-off depots. The curbside programs had a potential to serve only 11% of the province's 1,096,100 households during 1986. In addition 28 of the programs were run by a private operator or more commonly by a non-profit society. Because of this the survey was not able to report accurate estimates of the total quantity of materials collected during 1986. The total reported quantity from the incomplete returns was 16,378 tonnes or 0.8% of the 2.13 million tonnes of municipal solid wastes generated in British Columbia that year.

Since 1986 the province has started to make progress in the recycling field. The District of Delta in particular has been a provincial leader in recycling. In March of 1988 Delta began a multi-material curbside collection program in conjunction with the Delta Recycling Society (Delta Recycling Society, n.d.). During the program's first four months of operation approximately 1,335 tonnes of recyclable materials were recovered, which is equivalent to a 17% diversion rate from Delta's residential waste stream. Delta's commitment to recycling is particularly noteworthy because the municipality has free access to the Burns Bog landfill. Other communities are also planning to implement similar programs. For example, the Capital Regional District's curbside program is scheduled to start in the spring of 1989.

MUNICIPAL COMPOSTING PROGRAMS

Composting is the natural process of decomposition by micro-organisms of organic putrescible wastes into a stable humus-like material which can be marketed or reused. The micro-organisms, mainly bacteria and fungi, use the waste material as a food source breaking the wastes down into simpler

products, carbon dioxide and water. Composting is also a volume reduction technique capable of reducing the original waste volumes by up to 30% (U.S. Environmental Protection Agency, 1971). Materials in the municipal solid waste stream which are potentially compostable include leaves, other yard wastes, food wastes and paper products. Taken together these materials make up between 63-75% of the municipal waste stream. The composted material can be used by landscapers, nurseries, city works departments and resident gardeners as a soil conditioner or mulch.

Municipalities across North America are increasingly turning to composting as a partial solution to their waste management programs. Some municipalities have implemented leaf collection and composting programs, others leaf and yard waste programs and still others leaf, yard waste and food waste programs.

Good examples of leaf composting programs come from New Jersey where in response to a landfill crisis earlier this decade the State banned the dumping of leaves at landfills. The backyard burning of leaves in New Jersey had also been banned in 1972 under state air pollution regulations. Communities were directed to set up leaf collection and composting programs as an alternative. Currently the State has over 180 such programs in operation (Glenn, 1988b). The State also provided financial support for these programs and in conjunction with Rutgers University produced a leaf composting manual for New Jersey municipalities (Strom and Finstein, 1985).

The estimated costs of composting operations in New Jersey is $19.30 per ton or $3.38 per cubic yard which includes the shredding and screening of the material (Derr, 1988). As many municipalities in New Jersey have to transport their refuse great distances and some face tipping fees of $137 per ton (Derr, 1988) the advantage of composting leaves which account for an estimated 5-20% of New Jersey's municipal solid waste stream are clear (Strom and Finstein, 1985). In addition the final product of the composting process has an estimated market value in the State of $22 per ton (f.o.b.) for shredded and screened material and $12 per ton (f.o.b.) for unscreened material (Derr, 1988).

The large scale composting of leaf and yard wastes started in Portland, Oregon over eight years ago due not to solid waste concerns but rather air quality concerns resulting from backyard burning (Watson, 1988). At that time the U.S. Environmental Protection Agency funded a demonstration project involving three firms of which two remain in business. Together these two firms currently accept approximately 300,000 cubic yards of yard wastes. This volume accounts for an estimated 25% of the yard wastes generated in the Portland area. Portland's Metropolitan Service District hopes to see the diversion rate increase in the near future to 50-75% of total yard wastes. The two firms charge a tipping fee of $2.50-$3.00 per cubic yard for their service. They market their end product to the general public, landscapers, and nurseries.

In Alberta the Village of Ryley became Canada's first community to begin a curbside compost project involving leaf, yard and food wastes. The wastes are collected weekly in this community of 500 on the same day as their regular garbage collection. The residents are provided with two containers, a small kitchen container and a large outside storage container for food wastes along with biodegradable bags for yard wastes. In its first year the program collected 36.2 tons of organic household wastes which has reduced the Village's depending on landfills by 30%. The program was supported by Alberta Environment with grants totalling $58,000.

The Illinois Village of Barrington runs a composting program similar to Ryley, Alberta, but has also integrated their composting program with their curbside recycling program (Matsukis, 1988). Residents are provided with household containers for their recyclable materials, a 90 gallon container for food wastes and 60 gallon photodegradable bags for their yard wastes. Early results show a community participation rate of 90-95% and a reduction in landfilling requirements of 40%.

In British Columbia there are currently at least six leaf composting programs in operation as shown in Table 3-5. However, not all are aimed at the collection of residential leaf wastes but rather simply from city boulevards and parks. Perhaps the City of Vancouver and the District of Oak Bay run the most sophisticated operations.

TABLE 3-5
CURRENT LEAF COMPOSTING PROGRAMS IN BRITISH COLUMBIA

JURISDICTION	ANNUAL QUANTITY COLLECTED (cubic yards)	(tonnes)
Greater Vancouver Regional District[1]		
City of Vancouver	15,000	2,630
North Vancouver District Parks	5,000	880
West Vancouver Parks	N.A.	N.A.
U.B.C.	800	140
Total	20,800	3,650
Capital Regional District[2]		
District of Oak Bay	5,000	880
City of Victoria	1,600	280
Total	6,600	1,160
Total	27,400	4,810

Sources: [1] Resource Recovery and Recycling Committee, 1984.
[2] Capital Regional District, 1986.

TABLE 3-6
DOCUMENTED RECYCLING AND COMPOSTING TONNAGES IN NEW JERSEY, 1982-1986

	1982	1983	1984	1985	1986
Tons of Solid Waste Recycled	252,000	492,000	652,000	889,900	1,100,000
Number of Participating Communities	240	313	339	405	424

Source: New Jersey DEP Office of Recycling

CONCLUSION

The proceeding review of municipal recycling and composting programs has shown the potential available through these alternative waste management tools to reduce the volume of solid wastes going to landfills or incinerators. The results achieved by the State of New Jersey through the use of these alternatives, as shown in Table 3-6, is a clear demonstration of the potential. Over three-quarters of the state's 567 municipalities are operating recycling and/or composting programs and the state has been able to increase the quantity of material diverted from the waste stream by over 200,000 tons a year for four years.

3.3 ASSISTING MUNICIPAL RECYCLING AND COMPOSTING

If recycling and composting are attractive waste disposal options, then the question to be answered is why have more municipalities not undertaken these programs. Four reasons are provided. First, local governments have typically underpriced their waste disposal services by not accounting for all of the costs associated with landfills. Second, local governments may have lacked information on how to implement recycling and composting programs. Third, concerns over the stability or lack of markets for recyclable materials may have inhibited local governments. Fourth, the start-up costs of implementing recycling and composting programs may have proved to be a barrier.

The problem of underpricing waste disposal services was addressed in Section Two where recommendations were made which would provide local governments with full cost accounting estimates of the cost of landfilling and incineration and would require that the planning of solid waste management programs be based on these full cost estimates. Recommendations were also included in that section for the preparation of municipal recycling and composting manuals which, together with the technical support available from the proposed Solid Waste Management and Recycling Section, should provide the information municipalities require to implement recycling and composting programs. The strengthening of the recycling industry in British Columbia in order to provide stable and strong markets for recyclable materials will

be addressed in Section Four. This leaves the start-up costs of implementing recycling and composting programs as the final barrier to be addressed.

The provision of in-house storage containers, which was shown to be of great importance in achieving high public participation rates, could be a large capital outlay for communities wishing to start curbside programs. For example, the Blue Box containers are estimated to cost $5-8 each. The capital cost of the collection and processing equipment necessary can also be substantial as shown in Table 3-7. If the community is not already in possession of a suitable building and yard area for the recycling center one would have to be acquired. In addition the program would require an initial education and promotion campaign in order to acquaint the public with the program and how it operates. These costs could be as high as $1 per capita.

If one believes that provincial support for the start-up of local recycling and composting programs is justified then several options are available to government. They include the provision of capital equipment grants, operating cost grants, low interest loans, loan guarantees and various tax incentives.

EXAMPLES FROM OTHER JURISDICTIONS

The Ontario Ministry of the Environment has made a major commitment to support municipal recycling by the development of their Municipal Recycling Support Program (Ontario Ministry of the Environment, n.d.). For 1988 the program had $5.8 million available. Under the program the Ministry provides grants for:

a) Household Bins - typically 100% funding for Class 1 recycling programs.

b) Capital Equipment - determined on a case by case basis but usually 1/3 funding is provided. Municipalities must maintain ownership of the equipment.

TABLE 3-7

TYPICAL CAPITAL COSTS OF RECYCLING COLLECTION AND PROCESSING EQUIPMENT, 1987

EQUIPMENT TYPE	COST NEW	COST USED
	(U.S. $)	(U.S. $)
Collection Equipment		
Self-unloading Trucks	40-70,000	25-30,000
Flatbed with Bins	13-25,000	6-15,000
Self-unloading Trailer	5-9,000	2-7,000
Flatbed Trailer	4-8,000	2-5,000
Processing Equipment		
Horizontal Baler	40-250,000	20-100,000
Vertical Baler	6-12,000	3-7,000
Glass Crusher	2-5,000	1-3,000
Can Separator	2-4,000	1-2,000
Can Flattener	3-7,000	1-3,000
Can Densifier	12-25,000	8-15,000
Forklift	20-35,000	8-18,000
Front End Loader	20-35,000	8-18,000

Source: Glass Packaging Institute, 1988.

c) Operating Costs - partial funding of operating costs during the first five years; 50% of eligible costs in the first year, 40% in the second, 25% in the third, 20% in the fourth and 10% in the fifth year.

d) Promotion and Advertising Costs - 50% funding of eligible costs up to a maximum of 10¢ per capita for five years.

e) Feasibility Studies - 50% of eligible costs.

In British Columbia the Ministry of Environment has in the past provided funding assistance to municipal recycling programs. The Matching Grant Program provided one-time funds for the design and start-up of local recycling operations. The funds were to be used by a non-profit society but municipalities had to apply for and administer the grant. The maximum provincial contribution was $10,000 per applicant which the municipality had to match. However, the municipality's matching contribution could be an in-kind payment. At its height the program had a total of $100,000 available annually. The program was cancelled in 1984.

THE MINISTRY'S PROPOSAL

In its discussion paper the Ministry of Environment proposed the establishment of a capital grant program to support municipal recycling and composting operations. However, the proposal did not state the level of support which would be available. Only municipalities would be eligible for the capital grants and then only if the proposed program was shown to be economically viable and had identified suitable markets for the materials collected.

The comments received at the public meetings, during the special sessions and in the Task Force's correspondence left no doubt about the public's strong desire to participate in municipal recycling programs. The public wishes to see recycling programs implemented immediately with support provided by the Province.

The Ministry's proposed capital cost grant program received wide public support at the Task Force's meetings (37, 42, 45, 74, 75, 76, 77, 81, 92, 99, 106, 143, 147). However, some suggested that the program should also fund the operating costs of recycling and composting projects (37, 77, 92). Another suggested that the program offer low interest loans for capital equipment (106). There was also significant municipal support for the Ministry's proposal (31, 33, 39, 46, 59, 98, 110, 245, 253, 254, 257) although some rural area communities thought that the proposal was unlikely to benefit them (55). Several local governments felt any program established should be made retroactive in order to benefit any established municipal programs (55, 98, 248).

RECOMMENDATION

The Task Force believes that municipal recycling and composting programs can make a substantial contribution to municipal solid waste management in this province. While encouraged by the progress some communities have made in this area the Task Force believes that significant increases are possible and will be required if the province is to meet its recycling and composting goals of a 25% and a 10% reduction in the solid waste stream respectively. A Provincial grant program could help lower the start-up costs municipalities face in implementing recycling and composting programs. This may be particularly important now as many of B.C.'s municipalities are also facing large capital expenditures needed to overhaul their water and sewage systems plus their bridge and road networks (Union of B.C. Municipalities, 1985).

RECOMMENDATION 14:

The Ministry of Environment establish a five year Recycling and Composting Capital Grant Program for local governments. Local governments are to be eligible for capital grants only if recycling and/or composting of leaf and yard wastes were shown in their Solid Waste Plans to be justified and that markets for the materials produced had clearly been identified. The grants are to be for:

a) 100% of the cost of household containers, to a maximum of $8 per household, for residential recycling programs. Wherever practical, a standard recycling container is to be supplied in lieu of the equivalent funds.

b) 1/3 of the capital cost of equipment used primarily for recycling or composting.

c) 1/3 of the capital cost of apartment recyclable material storage containers.

d) 1/3 of the capital costs of rural recycling depot drop-off containers.

e) 1/3 of the capital costs of backyard home composters up to a maximum of $20 per composter.

f) 50% of the recycling programs initial promotion and education costs up to 50¢ per household.

3.4 RECYCLING WITHIN GOVERNMENT

One of the best ways in which government can demonstrate leadership is by its own example. The Provincial Government could show leadership in the recycling field by undertaking recycling projects in order to curtail its own waste production. An ideal candidate with which to start recycling in government is an office paper recovery program. It has been estimated that office workers generate on average between 0.6 and 1.0 kilograms of waste paper per employee per day (U.S. Environmental Protection Agency, 1977), almost all of which is recyclable.

EXAMPLES FROM OTHER JURISDICTIONS

At least seven U.S. states, and probably more, run office paper source separation recycling programs; Michigan, Maryland, Missouri, Ohio, Oklahoma,

Wisconsin and New York. For example, the Michigan program started in 1979 serving 200 employees but has continued to grow until now it covers 3,500 employees and ten of the nineteen state departments in the state capital of Lansing (Kennedy, 1987). The program is currently recovering 14 tons of office paper per month. Between 1979 and 1987 the program collected 700 tons of waste paper, generated a reported revenue of $58,000 and saved a further $24,500 in disposal costs. Recently the state governor ordered the program to be expanded to cover a total of 18,000 state employees.

The Province has operated a government recycling program in the past. The Paper Save Program was a high grade office paper source separation program which started in 1980. At its height the program covered nine Ministry of Environment office buildings in Victoria. The program involved the use of desk-top paper holders into which staff would place their waste paper. These holders were emptied at the end of each day into a central office collection bin. When filled the bins would be collected by the janitorial staff and moved to a storage area from which the paper would be collected by a waste paper broker. However, the program was curtailed after the program coordinator position was cancelled and after complaints from the janitorial staff to the building owners about their extra workload. Currently, only the Waste Management Branch's main Victoria office is still involved in the project.

THE MINISTRY'S PROPOSAL

In its discussion paper the Ministry of Environment proposed to expand the Paper-Save Program throughout all Ministry offices in the Victoria area. The proposal would see the eventual expansion to all Ministry offices throughout the province as it became feasible. One of the main reasons for this proposal was for the Paper-Save Program to act as a demonstration source separation program for commerce and industry.

The Ministry's proposal received generally favourable public and municipal comments (39, 45, 65, 74, 75, 76, 81, 92, 106, 248, 260). However, many thought that the program should be made mandatory in <u>all</u>

government offices (65, 74, 75, 76, 81, 92). It was also suggested that the Province encourage local governments and institutions to participate in similar programs (106).

RECOMMENDATION

The Task Force believes that it is indeed important for government to set an example in the recycling field and that the proposed expansion of the Ministry of Environment's Paper-Save Program would be a good way to start. The Task Force is also aware of and encouraged that the Purchasing Commission of the Ministry of Government Management Services has independently been considering the implementation of an office paper recovery program and had commissioned a study to examine its potential (Primax Business Systems, 1988). In addition, the Task Force agrees with the commentators that the program should be expanded government-wide as long as paper markets can be identified.

RECOMMENDATION 15:

The Province show leadership in the recycling field by establishing an office paper recovery demonstration project in all provincial government offices. The project is to begin with the Parliament Buildings and the Ministry of Environment's Victoria area offices and after six months should expand to all Ministries, Crown Corporations and agencies in the Victoria and Vancouver area. The program should expand to other areas of the province as soon as paper markets have been identified.

3.5 RECYCLING IN BUSINESS

Generally speaking the waste stream generated by a commercial enterprise or industry is more homogeneous in content than is the very heterogeneous contents of the household waste stream (Walsh and O'Leary, 1988). For this reason there is great potential for source separation recycling from the business sector. For example, retail outlets typically generate large quantities of corrugated cardboard wastes. Many firms, due

to the relatively high value of old corrugated cardboard, now recover and sell this material. As noted above office workers generate large quantities of high grade office paper waste which could also be recycled. Restaurants and bars will usually go through large numbers of glass containers such as wine and liquor bottles and food containers in a day. These materials could easily be separated for recycling.

A further advantage to the recycling of business wastes is that businesses typically pay for their waste disposal on a volume basis. Thus, they have a direct monetary incentive to participate in recycling ventures.

THE MINISTRY'S PROPOSAL

The Ministry of Environment's discussion paper recognized the potential for recycling within businesses and proposed the establishment of a commercial assistance program. Under this proposed program, Ministry staff would, on the request of a business, undertake a feasibility study of an office paper or other material source separation project. In addition, for office paper programs, the Ministry proposed to fund a portion of the cost of collection containers.

The Ministry's proposal met with some support at the Task Force's public meetings (92, 106, 135). However, others thought that businesses had the responsibility to undertake any feasibility studies and that government support was not required (73, 75, 76). One paper recycler wrote in to say that his and other firms were willing to provide the necessary storage containers to businesses free of charge if they would undertake an office paper recovery program but that he was unsuccessful at convincing businesses to do so (159). He felt that government financial support for business recycling was unnecessary but that government promotion and education was required. There was some municipal support for the Ministry's proposal (39, 98, 254), however, several local governments opposed the proposal believing the Province should provide a demonstration role only (149, 248, 266, 271, 272). One municipal brief suggested that office paper recovery be made mandatory for businesses above a certain employment level (19).

RECOMMENDATION

The Task Force agrees that there is great potential for recycling in businesses. The Task Force also agrees with those comments that direct government financial support for within business recycling projects is not required. Instead there appears to be sufficient interest amongst the commercial recycling industry to provide the equipment and containers required. However, there does appear to be a requirement for government involvement in the promotion and technical support of commercial recycling. The Task Force believes that government involvement should be limited to these two areas.

RECOMMENDATION 16:

The Ministry of Environment establish a Commercial Recycling Program to promote and provide technical support for the establishment of commercial source separation recycling programs.

3.6 RECYCLING INFORMATION

The importance of information to the recycling of household, commercial and industrial wastes must be stressed. The British Columbia public are very keen to start recycling but are frequently puzzled as to what can be recycled and where the materials can be taken. At the commercial/industrial level, it is commonly found that many producers could use the waste products of other industries as a raw material but are unaware of who would generate these wastes. Similarly, the producers of these waste materials may be unaware that these materials are of value to another firm. The options available to fill these information gaps include recycling hotlines and industrial waste exchanges.

RECYCLING HOTLINES

Recycling hotlines are typically well-advertised toll-free telephone numbers to which persons desiring information on recycling could call. Many jurisdictions such as Washington State, Oregon, Maryland, Virginia and

Ontario have recycling hotlines in place and others such as Alberta are considering them. In British Columbia, the Greater Vancouver Regional District (GVRD) has funded a hotline which covers their jurisdiction. The hotline is operated for the GVRD jointly by the Society Promoting Environmental Conservation (SPEC) and the Recycling Council of British Columbia (RCBC). In 1988, the cost of this service was $10,000 (149). The Capital Regional District (CRD) has also implemented a similar service within its own jurisdiction (131).

In its discussion paper the Ministry of Environment proposed that it work with the GVRD in order to expand the GVRD's recycling hotline to cover all of British Columbia by establishing a toll-free telephone number. The Ministry proposed to provide 50% funding up to a maximum of $20,000 per annum for the hotline service. This proposal met with general public support at the Task Force hearings (22, 36, 45, 76, 92, 106, 135, 143) and with municipal support (39, 55, 98, 110, 248, 261).

The Task Force believes that establishment of a province-wide recycling hotline would be a useful service for the people of the province. The Ministry of Environment should now work with the GVRD, the CRD and other interested local governments to establish and fund such a service.

RECOMMENDATION 17:

> The Ministry of Environment work with the Greater Vancouver Regional District and other local governments to expand the use of a recycling hotline to cover the entire province through the use of a toll-free telephone number and that the province fund 50% of the cost of the program.

INDUSTRIAL WASTE EXCHANGES

Industrial waste material exchanges are regularly published bulletins listing the types and quantities of industrial waste materials available and wanted. Interested parties then call the waste exchange and are put in touch with the waste material lister. Exchanges may also list services and

TABLE 3-8
THE CANADIAN WASTE MATERIALS EXCHANGE'S WASTE CATEGORIES AND LISTINGS FOR AUGUST, 1988

WASTE CATEGORIES	NUMBER OF LISTINGS FOR WASTES	
	Available	Wanted
1. Acids	12	7
2. Alkalis	39	7
3. Other Inorganic Chemicals	83	29
4. Solvents	33	6
5. Other Organic Chemicals	135	16
6. Oils, Fats and Waxes	31	14
7. Plastics and Rubber	47	39
8. Textiles and Leather	15	11
9. Wood and Paper Products	65	20
10. Metals and Metal Containing Sludges	39	42
11. Miscellaneous	43	17
12. Laboratory Chemicals	13	1

Source: Ontario Research Foundation, 1988.

TABLE 3-9
RESULTS OF THE CANADIAN MATERIAL WASTE EXCHANGE, 1981/82-1986/87

YEAR	WASTES TRANSFERRED	VALUE OF WASTES	NUMBER OF TRANSACTION	NUMBER OF WASTES LISTED
	(Tonnes)	($ Millions)	(#)	(#)
1981/82	188,000	5.32	241	1,576
1982/83	195,000	5.63	270	1,746
1983/84	210,350	6.16	324	1,950
1984/85	217,400	6.87	452	2,221
1985/86	279,400	9.5	483	2,435
1986/87	280,130	10.5	510	2,604
TOTAL	1,370,280	43.98	2,280	12,532

Source: Laughlin, 1987.

equipment available to waste recyclers. In Canada there is the Canadian Waste Materials Exchange, four provincial exchanges in Ontario, Manitoba, Alberta and British Columbia, and two municipal exchanges in the Ontario Regions of Peel and Waterloo. In the U.S.A. at least twenty exchanges have been created since 1980 (Mattheis, 1987).

Examples of the categories of materials carried and the number of listings on the Canadian Waste Materials Exchange is given in Table 3-6. Table 3-7 gives a summary of the results of the Canadian Waste Materials Exchange's operations over its first six years. The diversion of almost 1.4 million tonnes of waste materials into useful products is quite an admirable accomplishment. The waste exchange is funded in part by Environment Canada, provincial environment ministries, including British Columbia, and by industrial contributors. British Columbia's Ministry of Environment has an annual contribution of $2,000.

The British Columbia Waste Exchange was started in 1987 by the Recycling Council of British Columbia (RCBC) (74). Their waste exchange is a quarterly publication listing the waste material categories shown in Table 3-6 plus the added category of 'hazardous materials'. The quarterly bulletin also contains a directory of businesses, groups, organizations and services available in the recycling and waste management fields. Of course the RCBC's waste exchange is a more modest operation than the national exchange which has federal and multi-provincial support. For example, the Spring 1988 bulletin of the RCBC exchange contained a total of only 69 listings for wastes available and 55 listings for wastes wanted (RCBC, 1988). RCBC's waste exchange has been operating without provincial support.

The Canadian Council of Resource and Environment Ministers (CCREM), having recognized the potential for waste reduction through industrial waste exchanges, commissioned in November of 1987 a review of waste exchange programs in Canada and throughout the world. The report is believed to recommend increased government assistance in the short-term for a three-tiered (national, regional, local) waste exchange system. However,

CCREM has yet to formally release the report or issue any decisions on the implementation of its recommendations.

The Ministry of Environment, aware that the CCREM review was forthcoming, proposed in its discussion paper to provide interim funding assistance to RCBC's British Columbia Waste Exchange until a decision had been reached by CCREM on the national review. The proposal was for interim funding of 50% of exchange's cost to a maximum of $5,000 per annum. This proposal received generally favourable comments at the task force hearings (22, 36, 45, 74, 75, 76, 92, 106, 135, 143).

The Task Force agrees with the Ministry's proposal to provide interim funding of RCBC's waste exchange. However, the Ministry's proposed funding level may be far too low. For example, the Ontario Ministry of the Environment provided $25,000 to the Canadian Waste Materials Exchange in 1986/87 alone.

RECOMMENDATION 18:

The Ministry of Environment provide interim funding of $25,000 or 50% of the annual costs of the Recycling Council of British Columbia's Industrial Waste Exchange while the Canadian Council of Resource and Environment Ministers reviews the establishment of a national waste exchange system.

3.7 OTHER RECYCLING ISSUES

Several issues of a more minor nature, but still of importance, regarding the establishment of municipal recycling programs were brought forward during the public meetings.

INTEGRATION OF EXISTING FACILITIES AND PROGRAMS

In many communities, there exists non-profit recycling societies or service groups who undertake limited recycling activities. For example, Boy

and Girl Scouts may undertake paper or bottle drives. By using their volunteer labour, they collect the materials as a fund-raising activity. Non-profit recycling societies have sprung up in some communities due to its members' concerns about and commitment to the environment. Many of these groups undertake their worthwhile efforts with little or no assistance from local governments.

Concerns were expressed to the Task Force that the establishment of municipal recycling programs could simply push aside these groups. The Task Force believes that to some extent this will be inevitable. However, the Task Force is convinced that if an attempt is made to integrate existing programs into an expanded municipal recycling program that most groups can be accommodated. For example, when the District of Delta began its curbside recycling program, it did this in collaberation with the Delta Recycling Society. In addition, the Delta Recycling Society has incorporated the Scouting organizations' former fund-raising activities into its program.

RECOMMENDATION 19:

> Local governments, when establishing recycling programs, are encouraged to use existing facilities and to integrate established programs whenever possible.

PUBLIC OR PRIVATE SECTOR COLLECTION

The Task Force heard briefs arguing both for and against the use of public sector crews over private sector crews to undertake the collection and processing of recyclable materials (78, 92, 106). However, the Task Force does not believe there is anything inherently advantageous in the use of either private or public sector workers. Instead, local conditions and requirements will determine which sector will best fill the communities requirements.

RECOMMENDATION 20:

Local governments should be left to determine the best means, either by the public or private sector, for the collection and processing of recyclable materials in their community.

HANDICAPPED AND SPECIAL NEEDS WORKERS

During its provincial tour, the Task Force had the opportunity to visit local recycling facilities such as the Delta Recycling Society, the Penticton Recycling Depot and the North Okanagan Recycling Ltd. Some of these facilities employed handicapped and special needs workers to do the intermediate processing of the recyclable materials, such as sorting, grading or crushing. The supervisors of these workers praised the workers' hard work and dedication towards their jobs. Most of these workers were employed under federal and/or provincial job training programs which subsidize the wages of the special workers. The Task Force was impressed by the capabilities demonstrated by the handicapped and special needs workers and believes that there is a special niche in the recycling industry for employment of these workers irrespective of the availability of federal/provincial job training programs. However, the Task Force is concerned that when recycling programs are established that their viability becomes dependent on the availability of the federal/provincial wage subsidies. The long-term viability of recycling programs must be determined on its merits as a waste disposal option and the funds from job training programs should not be needed to subsidize the disposal of society's solid wastes.

RECOMMENDATION 21:

While the use of handicapped and special needs workers is strongly encouraged in recycling programs, the program's viability should not be made dependent on the availability of federal or provincial job training grant programs.

SCAVENGING

Some concerns were raised about the possibility that the higher valued materials set out for collection by a recycling program could be creamed-off by unscrupulous scavengers prior to the authorized collection of the materials. While this has not been a major problem in the U.S., incidents of unauthorized scavenging have occurred resulting in the passage of state or local ordinances outlawing the practise. The Task Force believes that it would be wise to eliminate the potential for this practise to develop before it occurs.

RECOMMENDATION 22:

The Ministry of Environment should consider amending the Waste Management Act to include a provision prohibiting the scavenging of materials set out for a municipally authorized recycling program, if Municipal by-laws for this purpose prove to be ineffective.

SECTION FOUR

DEVELOPING THE RECYCLING INDUSTRY AND MARKETS

4.1 INTRODUCTION

In Section Three recommendations were made which, if implemented, would have the potential to produce large increases in the quantities of recyclable materials collected. However, it would be pointless to bring about large increases in the supply of recyclable materials if there were not the concurrent expansion of the demand for these materials. Otherwise these materials would be dumped on weak or non-existent markets which could render unprofitable existing recycling programs and businesses and lead to the collapse of the recycling industry in general. The purpose of this section is to make recommendations of ways government could help to expand the markets for recyclable materials and to develop a more complete recycling industry.

4.2 BACKGROUND

The age old question of which comes first, the chicken or the egg, is analogous to the problem of developing recycling markets; which comes first the supply or the demand for recyclable materials. Potential manufacturers of recycled products claim that they would purchase recyclable materials if only there was a stable supply of recyclable materials available at a specified quality. Potential suppliers of recyclable materials claim they could develop sufficient quantities of the materials at the specified quality if only there was a stable demand for the materials. Obviously the answer is that the supply and demand for recyclable materials must be developed together. If government can provide the stimulus to bring about this development then there is the potential for considerable social and economic benefits for the people of British Columbia.

To understand the options available to government to assist the recycling industry requires an understanding of the recycling loops, shown

in Figure 4-1. The recycling loop starts at the household (or business) where after goods are consumed the recyclable portion of the goods are separated from the waste stream for collection by primary recyclers. Primary recyclers collect the materials from the households or businesses and carry out intermediate processing such as sorting, crushing, baling or benefication of the materials. The recyclable materials are then passed to the secondary recyclers who undertake the final processing of the materials and the manufacturing of the materials into a recycled product which is available for sale back to the households which closes the recycling loop.

DEFINITION OF TERMS

When discussing the markets for **recyclable materials** we are primarily discussing the link in the recycling loop between primary and secondary recyclers. However, when discussing the markets for **recycled products** it refers to the link between secondary recyclers and households. Finally when discussing the **recycling industry** it refers to both primary and secondary recyclers, the markets for recyclable materials and the markets for recycled products.

DEVELOPMENT OPTIONS

The options available to government to assist the recycling industry can best be described by working backwards through the recycling loop. First, government can increase the demand for **recycled products** either directly by increasing government purchases of these products or indirectly by consumer education aimed at changing consumer preferences. Second, government can enhance the supply of **recycled products** directly by providing secondary recyclers with grants, low interest loans or tax incentives, or indirectly by funding research and development of new recycled products and production processes. Both of these first two options will of course increase the demand for **recyclable materials** as the demand for these materials is derived from the markets for **recycled products.** Third, the supply of **recyclable materials** can be enhanced by providing primary recyclers with grants, low interest loans or tax

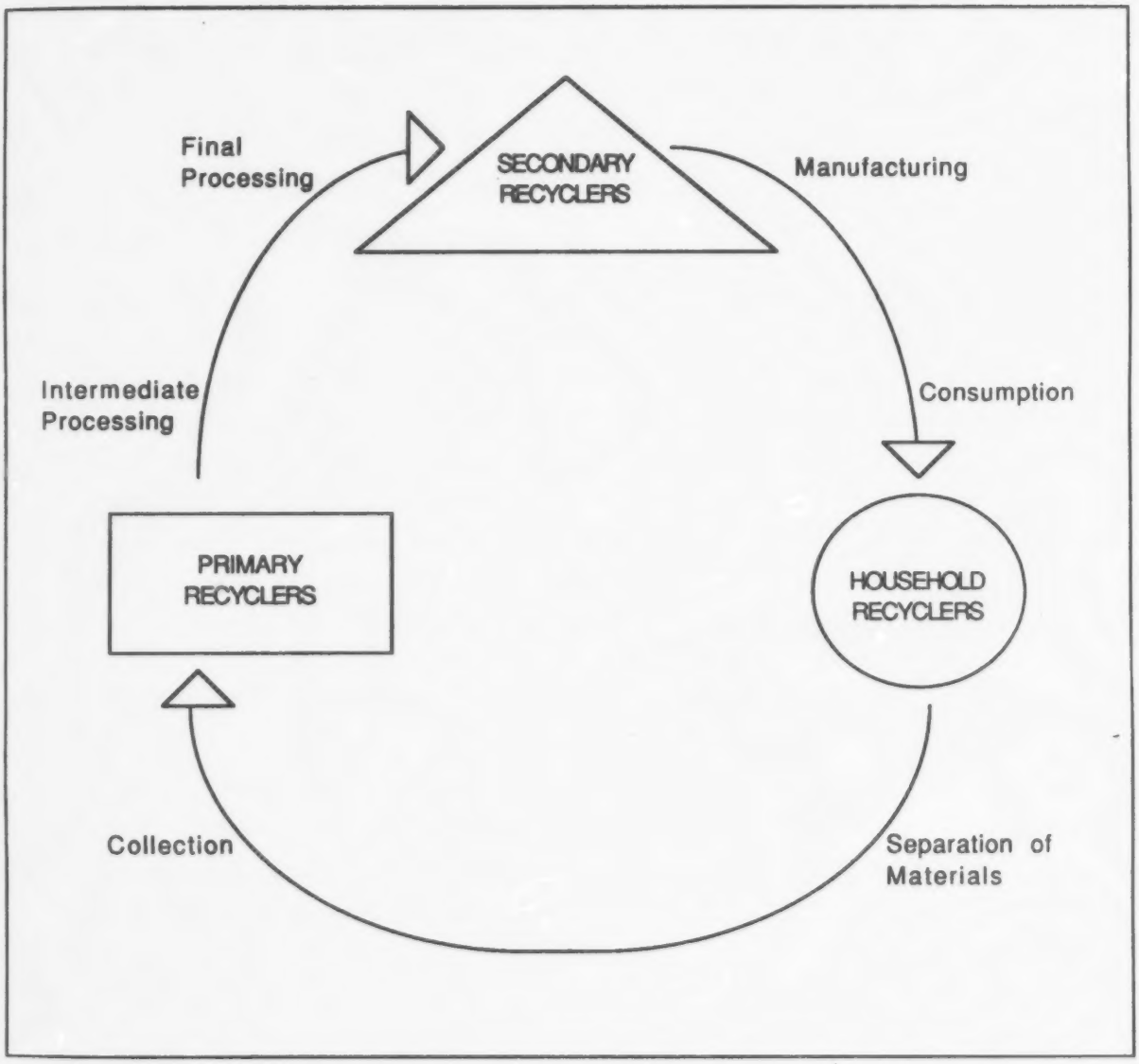

FIGURE 4 - 1

THE RECYCLING LOOP

incentives in order to reduce the costs of recyclable materials and make them more competitive with virgin materials. Finally, the government can promote the separation of recyclable materials from household wastes either by public education or by the full costing of waste disposal services back to the waste generators. By increasing the supply of separated materials the primary recyclers would be able to fully exploit any economies of scale in the collection, transportation and processing of the separated materials.

4.3 RECOGNITION OF THE RECYCLING INDUSTRY

It appears that many people in the recycling industry feel very much like Rodney Dangerfield - they don't get any respect. Yet their industry provides employment, income, tax revenue and foreign trade for the people of British Columbia. In addition by diverting materials from the waste stream they are providing a significant environmental service for the province. Still recyclers believe that their industry is not generally recognized as being a valuable part of the British Columbia economy.

In particular, recyclers believe that their industry cannot access the various economic development programs offered by different levels of government (74). There was a great deal of public support for the concept of development programs for the recycling industry, be they capital equipment grants, low interest loans, loan guarantees or tax incentives (22, 37, 42, 65, 74, 80, 81, 96, 143, 147). Several local governments also suggested provincial support of the recycling industry was necessary (39, 55, 62, 98).

Table 4-1 lists the identified employment in British Columbia's recycling industry. The tables shows a total of 1,478 people currently employed in the industry with 29% in primary recycling and 71% in secondary recycling. The table does not include many other businesses which could be considered part of the recycling industry such as used auto part firms or those persons in the soft-drink and brewing industry who are employed in the return of beverage containers.

TABLE 4-1

IDENTIFIED EMPLOYMENT IN THE BRITISH COLUMBIA RECYCLING INDUSTRY

PRIMARY RECYCLERS	
Non-Profit Societies (1)	186
Businesses (1)	243
Primary Total	429
SECONDARY RECYCLERS	
Consumers Glass Ltd. (2)	475
Paperboard Industries Corp. (3)	480
Mohawk Oil (1)	65
Others (1)	29
Secondary Total	1049
GRAND TOTAL	1478

Source: (1) R.C.B.C.
(2) Brief No. 41
(3) Filliatrault, pers. comm., 1989

TABLE 4-2
BRITISH COLUMBIA WASTE EXPORTS, 1986

CATEGORY	QUANTITY	VALUE
	(tonnes)	($000's)
METALS		
ALUMINUM	14,800	16,874.2
BRASS AND BRONZE	1,676	2,012.3
COPPER	3,763	5,054.6
IRON	3,693	394.0
LEAD	1,233	2,012.3
STAINLESS STEEL	2,159	1,582.6
STEEL	93,791	10,886.6
TINPLATE	22	6.5
METALS TOTAL	121,137	38,823.1
PAPER		
NEWSPRINT, BEATER STOCK AND REJECTS	67,648	27,672.0
OTHER WASTE PAPER	63,217	13,436.9
PAPER TOTAL	130,865	41,108.9
GRAND TOTAL	252,002	79,932.0

Source: B.C. Ministry of Economic Development, 1987.

The recycling industry in British Columbia is already developing export trade for the province, as shown in Table 4-2. However, the majority of the waste products currently come from industrial sources, the exceptions being aluminum, of which a high percentage comes from used beverage containers, and newsprint. While materials recycled from the municipal waste stream have yet to make up a significant portion of our waste exports the potential is significant. The destinations of these waste exports are given in Table 4-3 which shows that the U.S.A. and the far east are, not surprisingly, our major markets.

The Task Force shares the belief that the recycling industry is a valuable industry deserving of at least equal access to all of the government's economic development programs. Indeed because of the additional environmental benefits attributable to the recycling industries' activities the Task Force believes that the recycling industry should be given a high priority for assistance.

RECOMMENDATION 23:

The recycling industry in British Columbia should be recognized as a valuable manufacturing, job creating and trade development industry and the recycling industry be treated as a priority industry for the economic development programs of the Ministry of Regional Development.

4.4 A PROVINCIAL PROCUREMENT POLICY FOR RECYCLED PRODUCTS

The government can directly stimulate the demand for products made from recyclable materials through the use of its procurement policy. By giving a preference to products made from recyclable materials government can use its large purchasing power to create or expand the production of these products which would in turn expand the demand for recyclable materials. Other arguments given in favour of government procurement policies state that government purchases would provide stability to the market and would yield public information on the quantity, quality and price of the available goods made from recyclable materials.

TABLE 4-3

PURCHASERS OF B.C. WASTE EXPORTS, 1986

COUNTRY	QUANTITY	SHARE
	(tonnes)	(%)
1. United States	178,433	70.8
2. Japan	21,453	8.5
3. South Korea	19,126	7.6
4. Taiwan	18,743	7.4
5. Hong Kong	8,994	3.6
6. United Kingdom	2,801	1.1
7. All Others	2,452	1.0
TOTAL	252,002	100.0

Source: B.C. Ministry of Economic Development, 1987.

Procurement policies can take several forms. The most basic form is to give a simple preference for products made from recyclable material which are of the same quality and the same price as products made from virgin materials. A second form is to give a price advantage, usually of 5-10%, to the recycled product. For example, under a 10% price advantage if the recycled product is not the lowest bid it would still be purchased if it meets the quality requirements and it is within 10% of the lowest bid. A third form is for government to set minimum purchasing quantities, usually expressed as a percentage of total purchases, for products made from recycled materials regardless of any price differential. A combination of price advantage and minimum purchasing quantity can also be used.

EXAMPLES FROM OTHER JURISDICTIONS

Many jurisdictions already have or are considering implementing procurement policies. The most popular policy by far concerns paper products. Table 4-4 summarizes the paper product procurement policies of 13 U.S. states. The paper content requirement refers to how much recycled paper must be in a paper product in order for the product to qualify under the procurement policy. Secondary paper usually refers to products which are recycled prior to being used such as flawed products or production over-runs. Post-consumer paper is paper which has been used for its intended purpose and would otherwise have entered the waste stream. As shown in the table the content requirements vary substantially across jurisdictions. Five of the 13 jurisdictions listed in the table also offer a price preference for paper products which meet the content requirements. Only one of the states, New Jersey, has included a minimum purchase requirement.

THE MINISTRY'S PROCUREMENT POLICY PROPOSAL

In its discussion paper the Ministry of Environment recognized the need for the market development of recyclable materials and proposed the establishment of a provincial procurement policy. The proposal would have the procurement policy initially apply to paper products and rerefined lubricating oils with other products made from recycled materials added as they become economically viable. The policy for paper products would give

TABLE 4-4

EXAMPLES OF PAPER PROCUREMENT POLICIES IN OTHER JURISDICTIONS

JURISDICTION	PAPER CONTENT REQUIREMENT			PRICE PREFERENCE (%)	MINIMUM PURCHASE (%)
	SECONDARY (%)		POST-CONSUMER (%)		
California	50	inc.	10	5	
Florida	n.s.		n.s.	0	
Illinois	n.s.		50	0	
Maryland	80	inc.	80	0	
Minnesota	n.s.		n.s.	0	
Missouri	n.s.		n.s.	0	
New Jersey	n.s.		50	10	45
New York	40		n.s.	10	
Ohio	n.s.		n.s.	0	
Oregon	50	or	25	5	
Rhode Island	50	inc.	25	5	
Washington	n.s.		50	0	
Vermont	n.s.		50	0	

n.s. - none specified

inc. - including

Source: Vandenberg, 1986 and Stone and Douglas, 1988

first preference to products containing at least 50 percent secondary fibre including 25 percent post-consumer fibre, second preference to products containing more than 1 percent post-consumer fibre, and third preference to products made solely from virgin materials. The reason for the second preference to paper products containing more than 1 percent post-consumer fibre was to encourage the widespread use of post-consumer fibre at paper mills throughout the province without the need for significant additional head-works in the mills. For lubricating oils, preference would be given to products containing at least 50 percent re-refined oil. The preferences would apply only to those products manufactured in British Columbia. No price preference would be given. The existing return on investment (value added) analysis given to goods made in British Columbia would apply.

The public response to the discussion paper procurement policy proposal was one of general support for its establishment (16, 36, 45, 65, 74, 75, 76, 81, 92, 101, 106, 135, 137, 143, 145, 147). However, some thought that the policy should be extended to cover all products made from recyclable materials (74, 75, 76). Another suggested that the policy include the use of ground tire and glass for highway construction (145). Others thought that the policy should also include a price preference, suggesting a preference of 25% (16) and 5-10% (81). Municipal support for this proposal was also strong (26, 30, 39, 98, 149, 248, 251, 254, 261, 266, 271, 272). Several local governments believed the proposal should be expanded to include recycled asphalt and crushed concrete aggregate (98, 149, 266, 271, 277).

RECOMMENDATIONS

The Task Force believes that the Ministry's proposal is a good one as far as it goes. We also believe that the addition of a price preference or minimum purchasing requirements to the policy is unwarranted. Products made from recyclable materials must be able to survive in a competitive market in order to ensure their long-term viability. In addition the provision of a price preference would be tantamount to providing an indirect subsidy to waste material generators. Instead the Task Force believes that goals for the purchasing of recycled products should be set and used as the ongoing

means of encouraging the expanded use of recycled products. These goals should be annually reviewed by the Ministry of Environment and the Purchasing Commission of the Ministry of Government Management Services.

RECOMMENDATION 24:

The Province establish a procurement policy giving preference to materials made in British Columbia in whole or in part from recyclable materials. Initially the procurement policy is to be for paper products, giving first preference to products containing 25% or more post-consumer fibre and second preference to those containing 1% or more post-consumer fibre, and for lubricating oils containing at least 50% rerefined oil. Other materials are to be added as they are shown to be economically viable. While no price preference is recommended, the Province is to annually review and set procurement goals for each material, for example in the first year the Province should purchase a minimum of 25% of its car and light duty truck lubricating oils from rerefiners.

There is no reason why procurement policies should be limited to the Provincial Government. Once the Province has its policy in effect it should encourage the establishment of similar policies by local government, institutions and industries.

RECOMMENDATION 25:

Other levels of government, institutions and industries should be encouraged to develop procurement policies similar to that of the Province.

4.5 TAX INCENTIVES

The current federal and provincial tax system has been criticized by recyclers for providing incentives for the use of virgin materials over recycled materials (36, 74). They claim that they are not competing on a

level playing field and call for similar tax concessions for their industry.

Unfortunately the recyclers' claim that the tax system is distorted in favour of the extraction of virgin materials is not without foundation (see Vincent, 1985). For example, the expensing provisions and depletion allowances available to the logging and mining industries under the Income Tax Act (Canada) provide significant tax reductions and promotes the development of these industries. In order to correct this imbalance in the tax system the government has the options of removing the current tax advantages for virgin materials or of creating similar or equal tax breaks for the recycling industry. While the first option of removing the tax advantages for virgin materials may appeal to the economic purist, the potential for economic disruption in these industries will in practice rule out this option. Government is left with the provision of new tax breaks to the recycling industry as the preferred course if it is believed that the current tax system significantly distorts the price of virgin materials.

EXAMPLES FROM OTHER JURISDICTIONS

In the U.S.A. the states of Oregon, North Carolina and New Jersey are the only states offering some form of recycling incentive tax credit program although New York proposes such measures in its state solid waste management plan (New York, 1987). In New Jersey a tax credit of 50% spread over five years can be applied against the state's corporate business tax for industries purchasing eligible recycling equipment. In order to be eligible the equipment must be for recycling post-consumer wastes, which eliminates industrial scrap, must be used exclusively within the state and must be certified by the state's Department of Environmental Protection. New Jersey also provides an exemption from the 6 percent state sales tax for the purchasing of recycling equipment.

The state of Oregon offers three tax credit programs in order to assist the development of the recycling industrial sector. The Department of Energy provides for 35% corporate income tax credit over a five year period for any equipment used solely to transport or process recyclables. The

Department of Environmental Quality allows up to 50% credit over ten years relative to the certified value of a facility recovering resources, including emission controls for incinerators. The third program applies tax credits specifically to plastic wastes and provides up to 50% allowance over five years for equipment to manufacture new products from reclaimed wastes.

RECOMMENDATIONS

A potential candidate for tax relief for recyclers under provincial jurisdiction is the Social Service Tax Act. Currently the Act provides forty classes of exemptions from the sales tax. Examples of these exemptions include:

a) tangible personal property used solely for farm purposes,
b) grain, mill and other agricultural feeds, seeds, fertilizers, insecticides, fungicides and weed control,
c) self propelled vessels of more than 500 tons gross,
d) balls, rods, and similar detached media used for grinding ores (see Section 4 of the Act).

Of particular interest is the exemption provided in the Act for energy conservation equipment and materials. This last exemption was implemented at a time when energy prices were rising rapidly and its was deemed to be socially desirable to promote energy conservation. At this time of dwindling landfill capacity and of growing environmental concerns about waste disposal it would seem to be socially desirable to promote recycling in a similar manner. The provision of an exemption to equipment and materials used in recycling and composting from sales tax would be a partial assistance to recyclers.

RECOMMENDATION 26:

The Province exempt capital equipment and material primarily used for the collection, processing and manufacturing of recyclable materials from the Social Service Tax.

In a similar vein the exemption of recycling and composting equipment from the federal Manufacturers Sales Tax would also be of assistance. Together the two exemptions would provide a significant reduction in the start-up costs for recyclers.

RECOMMENDATION 27:

The Province request the Federal Government to exempt capital equipment and material purchased for the collection, processing and manufacturing of recyclable material from the Manufacturers Sales Tax.

The Income Tax Act (Canada) contains a provision for the fast write off of pollution control equipment against income. This provision, administered by Environment Canada, was designed to promote industrial pollution control. The 'Accelerated Capital Cost Allowance' allows for the costs of pollution control equipment to be depreciated at a rate of 25% in the year the equipment is purchased, 50% in the next year and 25% in the third year.

Unfortunately, recycling equipment purchases are not eligible under the accelerated capital cost allowance. However, recycling does contribute to pollution control by diverting many materials from landfills and incinerators and potentially from special waste disposal facilities. The allowance in its current form also discriminates against the recycling industry by assisting virgin material producers with their pollution control costs.

RECOMMENDATION 28:

The Federal Government be requested to extend the Accelerated Capital Cost Allowance for pollution control equipment to include capital equipment used to process and manufacture recyclable materials.

The Environment Council of Alberta in its review of recycling in Alberta made a similar recommendation regarding the accelerated capital cost

provision to the Alberta Government (Environment Council of Alberta, 1987). Thus, the potential is there for Alberta and British Columbia to together pursue this proposal to the Canadian Council of Resource and Environment Ministers and other forums.

4.6 TRANSPORTATION OF RECYCLABLE MATERIALS

The high cost of transporting recyclable materials to markets was cited by some as the greatest obstacle to the recycling industry (2, 8, 26, 37, 48, 49, 62, 64, 106, 213, 255, 261, 265, 273). This was felt most strongly in the northern and interior communities outside of the Lower Mainland, Okanagan Valley and Southern Vancouver Island. Suggestions heard by the Task Force to alleviate this problem included:

a) The provision of provincial transportation subsidies (55, 106, 109, 110, 124, 255, 273).
b) The set-up of a network of provincially run central material depots for the marketing and shipping of recyclable materials (143).
c) The creation of a provincial recycling marketing board to find markets and undertake shipment of the materials (109, 114).
d) Amendments to the Motor Vehicle Act to facilitate the back-hauling of recyclables (124, 261).

The Task Force, while recognizing that high transportation costs relative to the value of the recyclable material may make recycling unviable in some areas of the province, does not believe that the Provincial Government should become directly involved in the marketing of recyclable materials or in the provision of transportation subsidies. Instead the Province should tackle the transportation problem by attempting to stimulate the creation of new markets for recyclables throughout the province. Indeed the recommendations contained throughout this section are meant to do just that. In addition, the Province should review its road and rail transportation policies and regulations in an attempt to facilitate the backhauling of recyclable materials to markets.

RECOMMENDATION 29:

The Ministry of Transportation and Highways in conjunction with the Ministry of Environment review provincial transportation regulations to facilitate the backhauling of recyclable materials and to reduce any other transportation barriers for recyclable materials.

4.7 RESEARCH AND DEVELOPMENT

The demand for recycled products and recyclable materials could also be expanded through research into new uses for the materials and by the development of new production techniques. While the conduct of research and development is primarily a private sector responsibility there is ample room for public sector involvement. The justification for public sector involvement stems from waste disposal being primarily a public sector responsibility. If the public funding of research and development increases the demand for recyclable materials it would divert material from the solid waste disposal stream and result in lower public expenditures on waste disposal.

In Ontario the Ministry of the Environment runs a Demonstration Grant Program to support "pilot projects or studies designed to advance the state-of-the-art in recycling..." (Ontario Ministry of the Environment, n.d.). The program will provide up to 100% of the eligible costs of the project. In New Jersey the state provides ten year low interest loans (3% below prime) for R & D projects. Connecticut's Office of Policy and Management committed $400,000 (U.S.) during 1987 to fund research into new uses for recycled material and new recycling technology (Glenn, 1987).

The Task Force believes that, while the funding of research and development is primarily a private sector function, Provincial participation should take place when the potential benefits resulting from R & D funding could help to solve public sector problems. The Task Force believes that the funding of research and development for the recycling industry would

meet this criteria. However, wherever possible, the research and development projects should be a joint venture with the private sector in order to attract as much private sector funding as possible. In addition, Provinical participation in R & D funding of the recycling industry should be reviewed every five years to see if Provincial participation is still required.

RECOMMENDATION 30:

The Province establish a Recycled Product Research and Development Fund of $200,000 per year for five years. This fund, to be administered by the Ministry of Environment, is to be used for the funding of research and development of new methods of collecting recyclable materials, new uses for recyclable materials and new production techniques.

In addition to the direct funding of research and development government can play a role by the collection and dissemination of information on research conducted throughout the world. By acting as a central storehouse of information on new products and production techniques government could increase the access of British Columbians to this information. Government could also hold a regular series of technology transfer seminars for businesses, local governments and the public in order to increase this flow of information.

RECOMMENDATION 31:

The Ministry of Environment collect and disseminate on an ongoing basis information on research and development into new production methods and new products made from recyclable materials.

SECTION FIVE

RURAL AREA WASTE MANAGEMENT

5.1 INTRODUCTION

One of the major purposes of the Task Force's public tour was to receive ideas from the rural areas of the province on the type of government programs that would best address their specific and unique needs. Rural area solid waste problems are significantly different from those of urban areas which call for special rural area programs.

5.2 RURAL TRANSFER STATION GRANTS

The low population densities of rural areas have in the past led to the creation of numerous small refuse sites as people are typically unwilling to transport their garbage long distances. In the past these sites were often old Department of Highways gravel pits which the Department would occasionally send equipment to and have the refuse covered over. This was an environmentally unacceptable situation. However, over the last two decades the Waste Management Branch has been successful in having most regional districts accept responsibility for these sites and of the rural solid waste management function. While these developments have improved the rural solid waste management picture it has by no means solved all of the rural waste problems.

THE LANDFILL PERMIT SYSTEM

In order to understand the problems rural areas face in managing small rural refuse sites requires a brief review of the landfill permit system in British Columbia. The landfill permit system has five levels of permits each with a different level of operating requirements. The operating level a permit must meet is determined by the size of population being served by the site and the type of refuse being disposed of, as shown in Table 5-1. Rural refuse sites are typically at the C, D or E level of operation.

The intermediate cover requirements for each operating level is shown in Table 5-2. Intermediate cover is a minimum six inch layer of earth used to cover the refuse in order to control odours, blowing debris, fires, nuisance animals and to improve the aesthetic conditions of the site. As one moves down through the operating levels the required frequency for applying intermediate cover becomes less and less. This should not be surprising as to have equipment and personnel on site or to frequently transport them to the site in order to provide more frequent intermediate cover would be prohibitably expensive at small refuse sites.

PROBLEMS AT SMALL RURAL SITES

The infrequent intermediate cover provided at small rural sites can lead to several problems. These include:

a) Substantial windblown litter problems can occur,
b) The attraction of bears who become dependent on the site as a food source which inevitably leads to bear/human conflicts,
c) The accidental and/or deliberate open burning of refuse which can be a forest fire risk or potentially spread to the buried refuse which could then smoulder for long periods. The open burning of household garbage, which normally contains plastics, can produce toxic gases,
d) Provide a breeding place for insects, disease causing organisms, and other pests causing health concerns.

RURAL TRANSFER STATIONS

The problems associated with infrequent cover can be solved by closing down the smaller sites and centralizing the waste disposal function at a regional or sub-regional sanitary landfill site with a higher level of operating requirements. Unfortunately, the increased distances residents would have to transport their garbage would inevitably create a major illegal dumping problem. Several regional districts have solved both problems by replacing the small refuse sites with a system of rural transfer stations usually located at the old refuse sites which have been given their

TABLE 5-1
DETERMINATION OF LANDFILL OPERATING LEVELS

TYPE OF REFUSE	SIZE OF POPULATION SERVED				
	<500	500-1,500	1,500-5,000	5,000-10,000	>10,000
Municipal with or without Non-hazardous Industrial	E	D	C	B	A
Inert Municipal with or without Non-hazardous Industrial	E	E	E	D	D
Processed Municipal with or without Non-hazardous Industrial	E	E	E	D	C
Industrial including Hazardous Wastes	A	A	A	A	A
Industrial not including Hazardous Wastes	E	E	E	D	D

Source: Ministry of Environment, 1975, Tables 3-1 and 3-2.

TABLE 5-2
INTERMEDIATE COVER REQUIREMENTS FOR LANDFILLS

OPERATING LEVEL	FREQUENCY OF INTERMEDIATE COVER
A	Daily
B	Three times per week when operating 6 or 7 days per week or every second day of operation
C	Once per week
D	Once per 20 days of operation and at least once per month
E	Once per 40 days of operation and at least once every two months

Source: Ministry of Environment, 1975, Table 3-3.

final cover and have been closed. The refuse deposited at the rural transfer stations are regularly transported by the regional district to a central regional or sub-regional sanitary landfill for disposal.

Rural transfer stations need not be elaborate or costly structures. At sites serving small population levels they can be as simple as a 40 cu. yd. roll off container equipped with a predator proof lid and a drop off ramp. For servicing larger populations the transfer stations can be the more elaborate push-pit type with its enclosed structure. Examples of rural transfer stations currently operating in British Columbia are given in Table 5-3.

CASE STUDY: THE UPPER COLUMBIA VALLEY

Prior to 1987 the Upper Columbia Valley, part of the Regional District of East Kootenay, was faced with the rural solid waste problems outlined above. The valley shown in Figure 5-1 had a population of 6,600 and was served by six landfill sites. In 1987 the Regional District responded to the problems by implementing a sub-regional solid waste disposal plan. They established a central sub-regional landfill site (Operating Level A) at Windermere to service the entire Upper Columbia Valley. That same year the landfill sites at Edgewater and Fairmont were closed and replaced by transfer stations. The Invermere landfill site was also closed with all refuse from that community being directly hauled to the new sub-regional site. In 1988 the Brisco landfill site was also replaced by a transfer station and the same has been planned for the Canal Flats site in 1989.

The Regional Manager for the Waste Management Branch in the East Kootenays reports that the sub-regional plan implemented in the Upper Columbia Valley has resulted in a vast improvement in the solid waste management of the area (Lawrence pers. comm., 1989).

RECOMMENDATIONS

The Task Force believes that the top priority for improving solid waste management in rural areas is the upgrading of rural refuse sites. The Task

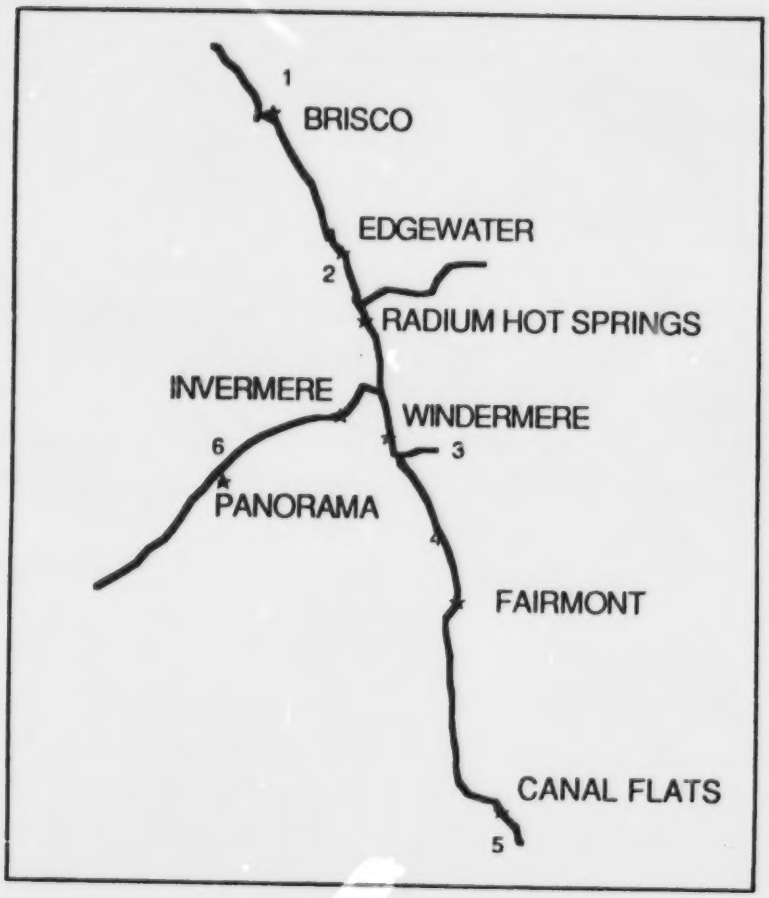

FIGURE 5-1

THE UPPER COLUMBIA VALLEY

TABLE 5-3

EXAMPLES OF RURAL TRANSFER STATIONS IN BRITISH COLUMBIA

LOCATION	POPULATION SERVED	CAPITAL COST	OPERATING COST
Edgewater (1)	1,500	$35,000	$35,550
Fairmont (1)	600	35,000	20,420
Brisco (1)	100	7,500	7,000
McLure (2)	200	18,000	7,500
Tranquille (2)	150	11,000	2,500
Blue River (2)	450	35,000	7,500
Balfour (3)	1,500	52,000	25,000
Ymir (3)	500	18,000	10,000
Salmo (3)	1,000	24,000	5,000

Source: (1) Lindstrom, pers. comm., 1989.
(2) Hart, pers. comm., 1989.
(3) Baldigara, pers. comm., 1989.

Force's visits to small rural refuse sites gave a first hand view of the problems experienced at these sites. The Task Force also believes that the best way available to upgrade rural sites is to implement a regional or sub-regional plan involving the establishment of a central sanitary landfill site together with a system of rural transfer stations which replaces the existing lower level refuse sites. This is a view shared by several large rural regional districts (12, 19, 26, 48). The Task Force also notes that many regional districts are or intend to implement such plans. However, many are impeded by the capital costs of implementation and in some cases, as noted in Section 2.7, by the failure of local referendums needed to raise the required funds. Because many of the programs recommended in the previous sections may not be practical in rural areas and because the upgrading of rural disposal sites is viewed as a priority, the Task Force believes that Provincial support for rural transfer stations is justified.

RECOMMENDATION 32:

The Ministry of Environment establish a Rural Transfer Station Capital Grant Program to provide 50% of the capital costs of establishing a rural transfer station up to a maximum of $20,000 per site.

The implementation of a rural transfer station system may also provide the means for rural area recycling to begin. The transfer stations could be provided with recyclable material drop off bins, the financial support of which is recommended in Section 3.3. As the refuse must be regularly collected it may be possible to collect and transport the recyclable materials at the same time.

5.3 AUTO HULK AND WHITE GOODS DISPOSAL

A study of scrap auto and white goods recycling in British Columbia estimated that approximately 65,000 autos are scrapped annually in province, as are an estimated 200,000 units of white goods (B.C. Research, 1980). White goods refer to products such as stoves, washers, refrigerators, hot

water tanks, etc. The same study estimated that 40% of the white goods and 94% of the scrap autos were recovered. Many of the autos not collected, the report concluded, were not recovered because of the high cost of collection and transportation of the hulks from remote locations.

Auto hulks and white goods were identified in many rural areas of the province as a significant disposal problem (8, 26, 28, 31, 48, 256, 261, 262). If there is a sufficient number of these products in one location scrap metal dealers will bring in a auto hulk crusher and salvage the products for their scrap metal value. Unfortunately in some rural areas there is an insufficient concentration of the products at one location to induce a salvager to take the products away. Instead they remain scattered around the countryside at the numerous small disposal sites. Rural landfill operators have no other choice but to bury these bulky items at their landfill sites which is costly and takes up an excessive amount of valuable landfill space.

In the past the Province has assisted local governments with the disposal of auto hulks. In August, 1971, Project SAM (Salvage old car bodies, Assemble at suitable collection depots, and Manufacture into smelter feed) was started as a crushing and transportation service for the elimination of abandoned and obsolete automobile bodies from the landscape. The Project SAM team consisted of two mobile crushers and associated transport vehicles with a total staff of nine. Local governments were responsible for gathering the auto bodies at one site where Project SAM's crushers could move in. In one year, 1973, Project SAM compacted 19,000 car hulks (Department of Recreation and Conservation, 1973). This program was phased out in 1984.

The Task Force believes that Provincial assistance in the clean-up of auto hulks and white goods is warranted. However, this assistance should be limited to concentrating these products from the rural areas of a regional district into one or more sites from which it would be viable for commercial operators to crush and haul. Such a clean-up of these large non- degradable products from the countryside would also be of benefit to our tourism industry by maintaining our 'super-natural beauty'.

RECOMMENDATION 33:

The Ministry of Environment establish a Rural Auto Hulk and White Goods Collection Program to fund 50% of the collection costs. This program is to assist in the collection of auto hulk and white goods to a central location in rural regional districts every second year. The regional district is to be responsible for identifying the sites of the auto hulks and white goods and, with the Ministry, contract for their collection.

5.4 REMOTE CAMP WASTE DISPOSAL

Regional Waste Management Branch staff from the Skeena and Cariboo sub-regions and the Vancouver Island Region report that waste disposal at remote industrial and recreation camps is a significant problem (29, 45, 122). The usual method of disposal at these sites is landfilling. While some of these sites are well operated many are operated as open dumps with little or no cover material provided. These sites quickly attract bears which become dependent on the sites as a food source. This situation leads to numerous nuisance bear complaints and the resulting destruction of many bears. When these remote camps are eventually abandoned the dumps are frequently left as an aesthetic eye-sore.

In order to correct this problem regional Waste Management Branch staff have been promoting the use of portable incinerators at remote camps. Currently under the regulations of the Waste Management Act remote camps of less than one hundred people operating an auxiliary fuel fired refuse incinerator are exempted from the permit requirements. In addition, the Skeena sub-region staff have developed a brochure outlining the benefits of portable incinerators which include:

a) minimization of bear/human conflicts,
b) open burning at landfills may cause forest fires,
c) savings in time and money as the incinerator can be located at or close to the camp site,

d) equipment is not tied up in landfill site maintenance, and
e) less potential for leachate problems (Ministry of Environment and Parks, n.d.).

RECOMMENDATION 34:

Remote camps of less than 100 people be required to dispose of its refuse by daily incineration or by the provision of bear-proof containers. Otherwise a waste disposal permit should be required.

5.5 OTHER RURAL AREA WASTE PROBLEMS

There were concerns expressed about the level of maintenance at refuse sites used by some, but by no means all, Native Indian Bands (45). To some extent, the problem is one of overlapping jurisdictions between the Band involved, the federal government and the Province. If the refuse site is located on reserve land then the Province has no jurisdiction over the site. If, instead, the refuse site is located on Crown Land then regional waste management personnel of the Ministry of Environment have found it difficult to enforce permit requirements. The Task Force believes that the problems must be addressed jointly by the Bands involved, the federal Department of Indian and Northern Affairs and the Province's Ministry of Environment. Closely related is a complaint from some local governments that they are not being compensated for Native Band use of the municipal waste disposal facility.

RECOMMENDATION 35:

The Minister of Environment seek funding from the federal Minister of Indian and Northern Affairs to pay for Native Indian Band use of local government waste disposal facilities.

The final rural area problem brought forward to the Task Force dealt with the monitoring and enforcement of disposal sites permits in rural areas. Concern was expressed that staffing levels and travel funds were

insufficient for the adequate monitoring of the many small disposal sites scattered across the province's rural areas. For example, in the Skeena sub-region there are 63 solid waste disposal permits distributed over a total area of 316,870 sq. km.

The Task Force does not believe that it is in a position to fully review the adequacy of monitoring and staffing in the rural areas of the province. This would, therefore, be an opportune time for the Ministry of Environment to review regional staffing and budgetting levels.

RECOMMENDATION 36:

The Ministry of Environment should review its regional staff and budget requirements for the management and planning of the solid waste program.

SECTION SIX

ENERGY AND RESOURCE RECOVERY

6.1 INTRODUCTION

Incineration, in its many forms of thermal destruction technologies, is a basic waste management alternative to sanitary landfilling although an associated landfill is still required to accept residual ashes and bulky non-combustibles. Although dependent on the process employed, considerable savings in weight and volume of wastes requiring disposal can be achieved such that space savings of 3 or 4:1, inclusive of intermediate soil covering requirements, can be expected relative to raw refuse disposal.

Relatively high capital and operating costs, further aggravated by emission control and ash handling concerns, are a persistent feature of incineration. Some financial relief is possible through the recovery of energy as heat, steam, electricity or fuel. It is important, however, that end-user demand closely relates to the constant year-round supply and that the incinerator is conveniently located for practical transmission of the energy to the user.

In some instances, prevailing climatic or environmental conditions alone may favour the adoption of incineration as the most desirable management alternative. Typically these circumstances might arise from concerns for leachate control in areas of high precipitation or where the mitigation of conflicts with wildlife might be the predominant objective.

6.2 BACKGROUND

Methods to optimize the management of municipal wastes can be considered under two broad categories, namely, before collection and after collection. To a large extent, systems appropriate to pre-collection are low-technology applications while efficient post-collection systems can be

highly mechanized. In the Ministry Discussion Paper, the latter was proposed to be most viable in the context of incineration with energy recovery including refuse derived fuel (R.D.F.) production. The former was identified as the practical choice for material diversion at source compatible with any alternative form of disposal for the remainder of the waste stream.

6.3 EXAMPLES FROM OTHER JURISDICTIONS

The policy of establishing a hierarchy of preferred management practices is becoming quite popular with environmental agencies, particularly in the United States. Commonly, this policy will identify an order of preference as (i) reduction of wastes at source, (ii) recycling, (iii) incineration, and (iv) landfilling. Some variations distinguish energy production as a separate and preferred category to incineration, and others equate landfilling and incineration as ultimate disposal techniques.

As might be expected, the most aggressive programs in support of incineration have occurred in areas where landfill alternatives are critically short in supply. New Jersey provides interest-free loans in support of incineration projects, a state-owned corporation advances the technology in Rhode Island and New York provides grants and requires any electricity produced to be purchased by utilities at a set rate per kilowatt-hour.

Of most interest to British Columbia is the program initiated in 1986 by the Ministry of Energy in Ontario. A budget of $25 million over 5 years has been established to provide capital grants to 15% of the total cost, to a maximum of $6 million per project. Federal funding assistance is also provided on a case-by-case basis. Under another program, the Province provides grants to one third of capital cost for material recovery and R.D.F. facilities.

One example of federal cost-sharing for energy-from-waste facilities in Canada was the FIRE grant program which terminated in 1986. Up to 20% of

eligible capital costs were forgiven where fossil fuels were replaced by renewable biomass energy sources. Prince Edward Island is reported to have benefited by some $40 million over 10 years for conservation projects and Greater Vancouver Regional District received over $8 million towards the incineration facility in Burnaby, as well as $1.5 million remission in federal sales tax to sell the steam produced.

6.4 PUBLIC COMMENTS

There was significant opposition expressed at the public meetings to the incineration of mixed municipal wastes (22, 23, 65, 66, 79, 81, 82, 106, 111, 113, 114, 116, 143, 145, 146, 147). The concerns centered on the possible production of toxic wastes, such as dioxins, furans and heavy metals, during the incineration process. Several briefs called for a ban or moritorium on the construction of new municipal incinerators or energy-from-waste facilities (23, 65, 81, 106). Others expressed the view that incineration was incompatible with recycling (16, 79, 113). Another suggested that permission to burn refuse derived fuel (RDF) should be withdrawn (145). If government support for energy-from-wastes goes forward, it was suggested that the program require that the maximum volume of reusable material be recovered before incineration (74, 75, 76).

The positive commentary received on the proposal recognized the potential for energy generation from woodwaste and/or municipal refuse provided electricity could realistically be fed to the B.C. Hydro grid system (26, 51, 55, 98, 255, 264, 269, 273). This sentiment was most fervently expressed in the interior regions of the Province. Small scale incineration in remote areas was acceptable to reduce landfill bear problems and to overcome operating difficulties caused by poor supplies of cover material (12, 253). Supportive comments were almost invariably qualified with the need for stringent environmental controls to be enforced by the Ministry of Environment (39, 48, 53, 54, 124, 149, 259, 266, 271, 272).

Concerns were expressed for the impact from emissions and the disposal of toxic ash (8, 39, 124, 149, 259, 266, 271, 272). Incineration and

recycling were viewed, to some extent, as incompatible particularly in the high energy materials such as paper and plastic items. In that respect, recycling was stated as being the preferred option and incineration should not be credited with achieving any portion of the projected 25% volume reduction objective (39, 55, 124, 248).

6.5 RECOMMENDATIONS

Considerable interest has already been shown in the potential for energy generation through waste incineration, particularly woodwastes. The Ministry of Energy, Mines and Petroleum Resources are well advanced in the development of a program to provide capital grants to energy-from-waste facilities to both municipalities and the private sector. Cabinet approval is still required for implementation and the program would be contingent on the receipt of matching federal monies. No broad consensus of opinion was received that the Province should expand its facilitating role to include destructive incineration without energy recovery, except in small, isolated applications.

With respect to concerns about the environmental impact from incinerator emissions, the Ministry is currently reviewing its requirements, essentially to up-grade allowable levels in line with the nationally recommended limits. A study has also been commissioned to assess the cost implications of these limits on smaller scale facilities. For the most part, acceptable levels are derived from the application of best available control technology. Disposal conditions for incinerator ash would be established on the basis of its compliance with the Special Waste Regulation. Although not yet well defined, the contaminant composition of ash from woodwaste and R.D.F. incineration is likely to render the disposal of the residuals to be less problematical.

The most up-to-date information on the implications of ash disposal from a modern incinerator is currently being generated as a result of the 210,000 tons per year mass-burn facility in Burnaby. Brought into full operation in 1988, the incinerator produces two discrete residues from the

process; 51,000 tons/year of bottom ash from the burning grates and 9,000 tons/year of fly ash which is a product from the flue gas cleaning process. Disposal is currently, by means of separate landfill cells each provided with leachate collection under-drains, a clay bottom seal and, ultimately, a clay cap once the cell is full. In addition, the fly ash cell is coated with "shot-crete" as intermediate protection and will include an impermeable synthetic lining before final covering.

The fly ash stream is commonly the one of most concern and test results so far have indicated metal concentrations to be satisfactory, except for lead. In that regard, source control efforts have affected reductions from original levels of 30% by removal of certain laboratory wastes from the feed material and further focus is being placed on the diversion of automotive batteries as the next suspected source. While results are not yet available for some other contentious contaminants, such as dioxins and furans, they are typically found in relatively low concentrations and are not expected to be of significant concern. Of course, as the trend towards more stringent control of stack emissions continues, higher contaminant levels in the ash have to be anticipated.

RECOMMENDATION 37:

The Ministers of State in regions with a woodwaste problem make energy-from-woodwaste projects a priority for assistance in their economic development regions.

RECOMMENDATION 38:

The Ministry of Energy, Mines and Petroleum Resources expand their proposed energy-from-waste assistance program to include projects which produce refuse derived fuel.

SECTION SEVEN

PUBLIC AND CONSUMER EDUCATION

7.1 INTRODUCTION

During the public review, it became clear that many people are anxious about possible environmental and health impacts of municipal solid waste management - the volume and composition of waste material, as well as the method of disposal. There were frequent demands for information on municipal solid waste management alternatives and the importance of changing public attitudes and practices about waste (14, 20, 36, 97, 112, 200). Further, it was recognized that information and education will contribute to changing purchasing habits and waste management practices.

Recommendations about improved communications are woven throughout the report. These recommendations address the needs of local government, recyclers, industry and the public. The objectives of these communications are to:

* develop an understanding of the situation (recommendations 8, 22);
* encourage voluntary change in practices (recycling and composting wastes, purchasing patterns, anti-litter) (recommendations 17, 18, 19, 42, 43, 44, 45, 54);
* encourage recycling markets - through waste exchange, hot line, and market information (recommendations 9, 20, 21);
* provide advice on recycling activities (recommendation 34); and
* afford opportunities for ongoing input into solid waste management (recommendation 11).

7.2 PUBLIC EDUCATION

Education appears to be a key element for changing attitudes and practice - both within the school system and with the general public.

Throughout the public review, submissions and comments highlighted the importance of building on existing awareness and concern about solid waste and through education encouraging individuals to help resolve the problem (33, 23, 79, 14, 80, 143, Ft. St. John City Council).

The absence of proposals about education was pointed out as a shortcoming in the Ministry discussion paper, and the school curriculum was proposed as an effective way to reach students and their families.

In British Columbia, classroom presentations are provided by the Greater Vancouver Regional District and the Capital Regional District, and Imagination Market promotes recycling through art workshops using manufacturing waste. In addition, a number of school and community projects have involved students (eg. bottle drives, litter pick up campaigns, etc.).

The British Columbia Ministry of Environment has developed and distributed print and video materials on solid waste management for schools (ie. Conserving Kingdom, Garbage is Resourceful, Resources and Wastes, and Waste Management Promotional Campaign). It is important that these materials remain up to date and relevant.

There are a number of agencies competing to have their message included in the school curriculum. However, classroom time and the basic curriculum content remain fixed. The Task Force has, therefore, concluded that integrating solid waste management into the school curriculum and reinforcing this message through school demonstration projects will be effective with students (R.D. Central Kootenay, P. Dowkes, Cam Murray).

RECOMMENDATION 39:

That the Ministry of Education incorporate waste management and recycling education into the school curriculum.

RECOMMENDATION 40:

That the Ministry of Environment establish a School Recycling Program to fund the cost of storage containers for source separation recycling projects in schools, colleges and universities and provide technical support for their set-up.

7.3 CONSUMER EDUCATION

In addition to the school program, the Task Force recognizes the need for information and education directed to wider audiences- beyond students and their families (Environment Sound Packaging Coalition, District of Squamish, District of Surrey, Harold Gruber, Nanaimo Regional District, Dr. Hal Knight, Health Action Network, Erica Scott, A. McKenzie, ETE). The Task Force, therefore, proposes provincial level public information and education programs on recycling. These provincial level programs would supplement the contribution of monies and generic information materials to the regional districts (per recommendation 17f).

RECOMMENDATION 41:

The Ministry of Environment produce a monthly or quarterly recycling newsletter to promote recycling.

RECOMMENDATION 42:

The Ministry of Environment undertake a province-wide consumer education program on the advantages of recycling and on consumer choices in product packaging.

7.4 ANTI-LITTER EDUCATION

Litter is a specific problem in municipal solid waste management. Anti-litter campaigns have been used in a number of jurisdictions throughout

North America. A litter study, brought forward as recommendation (50) includes the identification of the target audience for an anti-litter campaign. Presentations during the public review process recommend a long-term public education program to reduce littering (145, B.C. Soft-drink Assn., Canadian Council of Grocery Distributors). The objective of this education program is to reduce littering through developing understanding and compliance, rather than relying solely on the imposition of tougher regulations and more stringent enforcement.

RECOMMENDATION 43:

The Ministry of Environment prepare and implement a long-term public anti-litter education program.

SECTION EIGHT

LITTER CONTROL

8.1 INTRODUCTION

The legislation currently in effect for litter control is the Litter Act (1970) and its Regulations. The law's primary provisions express a strict liability against littering and the requirement for a minimum refund to be paid by a purchaser to a seller on the return of a prescribed soft-drink or beer-type container to the place of purchase. The beverage container provisions, instituted to alleviate public concern for the growing environmental nuisance and hazards to human and wildlife safety associated with persistent container litter, represent the first legislation designed for that purpose in North America. Other provisions control sewage discharges from boats, recreational vehicles and campgrounds, and establish ticket summons for offences under the Act.

After 10 years of operation, the container return system was subjected to a major review in 1980 and the assessment concluded that it was "waste management effective". In addition, the refund system could be extended to fruit juices provided bi-metal cans were recycled, and to wine and liquor containers although these could equally be collected by curbside recycling programs. The change from a retail-based return to a depot system was not assessed to be more effective.

The Litter Act currently exercises control over some 750 million container sales per year of soft-drinks and beers recovering more than 84 percent of the total.

8.2 BACKGROUND

The position presented in the Discussion Paper proposed the retention of litter controls on beverage containers but with a number of amendments to the return system for soft-drinks, essentially to simplify the system, make

it more universal and remove the recognized anomalies. In brief, the proposed simplifications consisted of first deleting all non-carbonated drinks and encompassing carbonated beverages only, in rigid, pressure-resistant containers. Secondly, to improve consumer convenience, the present limitation of 24 returns per day would be waived for the return of the same number of containers purchased in any transaction provided a receipt is presented and prior notification conditions are met.

The primary anomalies targetted by the proposals were the payment of handling fees to retailers in recognition of their role in the return system and to specify naturally as well as artificially carbonated beverages. Mineral water brands would therefore become subject to deposits.

To improve universality, refunds would be changed to mandatory deposits. In this way, the control of containers and their refunds would be vested with the bottler or distributor allowing containers to be returned to any retailer serviced by the bottler instead of only to the place of purchase. The secondary effects would be to afford ready monitoring of the system's effectiveness through composite bottlers' data and to ensure that competition in the trade is not compromised by the manipulation of refund requirements. The current enigmatic mixture of refund responsibilities resting arbitrarily with retailers in some situations and bottlers in others has been damaging to the container return system.

To provide a clearer perspective on the significance of mandatory deposits, a comparison between the operation of a refund and deposit system may be useful. Under deposits, a bottler is required to charge a minimum deposit when the beverages are distributed to a retailer, who in turn, includes a deposit levy on his sale to a consumer. This mechanism performs a number of important functions. In the first place, the consumer has a monetary incentive to return the container to redeem the deposit instead of discarding it to litter. Similarly, the retailer will be motivated to forward returned containers to the bottler in order to recoup the deposits, thereby, saving containers which are not readily recyclable from being dumped in bulk loads by the retail sector into the municipal landfill

stream. With deposits, it is the bottler who retains any unclaimed deposits resulting from non-return by consumers, and conversely, maintains control and responsibility for the containers he distributes. Further, since all containers are distributed and sold with a deposit applied, there is no financial impediment to the bottler to accept receipt of his containers independent of their return route through chain stores, corner stores, depots or recyclers.

The major difference in operation of a refund system compared to deposits is the latitude provided by the law for deposits to be initiated at any point in the marketing regime prior to the point of sale to the consumer. As a result, it is the retailer who can decide which containers he wishes to return to the bottler and, hence, the containers for which he is willing to pay a deposit, benefit from the salvage value of the containers through recycling and retain any unclaimed refunds. The primary shortcomings identified with the system are: (i) the reduced access of return for containers from the public because independent retailers rather than universal bottlers become concerned with refunds paid through individual outlets not exceeding deposits charged; (ii) the resulting exclusion of depots from the refund system for non-refillables; (iii) an increase in the market share of non-refillables, not only producing more waste containers for the same volume of beverage sold but more of the type of container susceptible to be littered; and (iv) the availability of the refund value to manipulate the product cost, creating an artificial and uneven basis of competition among bottlers.

8.3 EXAMPLES FROM OTHER JURISDICTIONS

A number of different approaches are employed in Canada and the United States directed at the control of litter and/or beverage containers.

Washington State is an example of a pure litter clean-up program. While no tangible incentives are provided to prevent littering, stiff penalties are imposed for offences and roadside containers are provided state-wide. Most pertinent is the program's funding for which the Model Litter Control Act (1971) imposes a manufacturers' tax on products,

packaging and containers reasonably related to litter problems. The tax on this broad range of goods is set at 0.015 percent of the gross value, the proceeds being used for litter control, recycling and public education. This style of program has been adopted in a further six U.S. states.

Oregon's container law (1971) typifies the retail return type of enactment and closely relates to the provisions in B.C. Refunds, not deposits, are stipulated, the controls apply to soft-drink and beer-type beverages only and it is non-restrictive on the allowable mix of container materials and designs marketed. Eight other states have adopted similar controls, the most recent being New York.

California's enactment (1987) represents a quite different approach on containers establishing a state-wide recycling goal of 80% for the soft-drink and beer industry, prompted by a redemption value of one cent payable at recycling depots operated by the major retailers. Redemption levels are to increase incrementally until the incentive is sufficient to achieve the goal. An administrative staff of more than 100 have been employed for this individual program.

In Canada, there have been a number of recent changes implemented in litter and container controls, and some others are under review. An overview of the various programs might best be exemplified by the following three jurisdictions, all of which have split systems for the return of refillables and non-refillables.

Until 1988, Saskatchewan permitted soft-drinks and beers to be sold in refillable containers only, and refunds were payable at retail outlets. The new amendment permits cans and plastic bottles on condition that a network of depots are available for their return; refillables continue to go back to retailers. An exclusive contract for the depots has been awarded to an association for handicapped people with 36 locations having been established to date. Under agreement with Alcoa, these depots will also process cans from border states for shipment back to the company's smelter in Tennessee. In its operation, the Province collects 7 cents from each can distributed

from which 2 cents subsidizes the depots and 5 cents becomes the deposit. The government retains any unclaimed deposits to fund other environmental initiatives.

As of January 1989, 32 manned depots provide jobs for 140 handicapped and 32 managers; 12 depots are in centres of 5,000 population or more, and the rest are rural. The current estimate for a can return rate is 40%. A total of 100 depots are projected to provide full service for can returns, implemented over the next two to three years.

Ontario's Regulation (1985) intermingles requirements on soft-drink container deposits, recycling and refillables. Brewers impose deposits voluntarily and are exempted. Refillables carry deposits which are refundable at retail outlets and brand owners are obliged to maintain refillables at a 40 percent sales share. Non-refillables must be recycled at a minimum of 50 percent of sales to avoid deposit or total prohibition of the container. In order to satisfy the recycling requirement, the beverage industry participates in the funding of multi-material collection programs in urban areas and depot facilities in the more rural settings of the province. In 1987, the government laid over 100 charges against producers for illegal market shares of non-refillables.

At the same time, a Recycling Advisory Committee was established by Order-in-Council to advise the Minister of Environment on container recycling with regard to implementation of programs, system monitoring, funding assistance, etc. Membership is representative of the container manufacturing industry, food and beverage sectors, government, unions, recycling and public interest groups.

Independently, the beverage industry struck a steering committee, Ontario Multi-Material Recycling Inc. (OMMRI), primarily to ensure that the 50% recycling rate required for non-refillables was met. OMMRI's promotion concentrates on "Class 1" curbside programs defined as three material collection weekly, on the same day as regular refuse, using a special recycling container. It is considered that while soft-drink containers

constitute some 1 to 5% of the municipal solid waste stream, the wider range of materials available for capture by these programs represents closer to 20% of the waste total. As of January 1989, it was estimated that 10-15% of all residential waste was diverted in areas served by blue-boxes. The return rate for non-refillable containers in areas with blue-boxes is being calculated using modifying formulae which do not produce a representative figure for recovery versus sales. For example, 45% of can sales are estimated not to be available from households and are automatically discounted. It would appear, however, that an unadulterated recovery of 30% for cans is probably a generous deduction.

In Alberta, the Litter Act (1972) provides for penalties and clean-up and the Beverage Container Act (1971) requires deposits on containers for soft-drink, fruit and vegetable drinks and juices, liquor, wine, imported beer, mineral and flavoured water, tea and non-alcoholic beer. Domestic beer containers are exempt but are subject to a voluntary deposit system operated by the Alberta's Brewers agents. Only refillables may be returned to retailers for refund but all containers are refundable through "universal depots". Beverage manufacturers are the source of the funding paying the depots a handling fee between 2.75 and 4.55 cents per container, another 1.5 cents to retailers and are responsible for container collections from depots and retailers.

As of January, 1989, deposit levels were simplified to minimums of 5 cents for one litre or less, and 20 cents over one litre. 210 depots were in operation of which 34 were in urban settings, primarily Calgary and Edmonton, and the range of container return rates was reported to be 48% for aluminum soft-drink cans, 54% soft-drink bottles, 80% wine and spirits and 88% two litre PET.

As a ready comparison with the performance in other jurisdictions, the following table presents container return rates in British Columbia over the most recent period of record from 1982-1986.

TABLE 8-1

BEVERAGE CONTAINER RETURN RATES, 1982-1986

	PERCENT OF TOTAL SALES				
	1982	1983	1984	1985	1986
BEER CONTAINERS[1]					
BOTTLES	97	97	99	99	96
CANS	60	64	69	73	73
ALL BEER CONTAINERS	95	94	94	94	91
SOFT-DRINK CONTAINERS[2]					
REFILLABLE BOTTLE	91	102	106	104	93*
NON-REFILLABLE BOTTLE	58	66	65	66	59*
PLASTIC BOTTLE	78	87	81	59	78*
CANS	36	44	53	36	29*
ALL SOFT-DRINK CONTAINERS	64	71	72	60	50*
ALL CONTAINER TYPES	87	88	88	84	80

[1]Liquor Distribution Branch and Pacific Brewers Distributors Ltd.
[2]British Columbia Soft Drink Association.

* Incomplete data. Containers with deposits initiated by retailers are not accounted for.

8.4 PUBLIC COMMENTS

With the exception of a number of interest groups, representative primarily of the soft-drink beverage industry, container manufacturers and major food retailers, the overwhelming opinion expressed to the Task Force was strongly in favour of the container refund system being retained, as a minimum, expansion of refunds to fruit juice, wine and liquor or to all rigid containers was more indicative of the public preference. Other comments suggested increasing deposits on cans (26, 30, 35, 46), routine analysis to monitor effectiveness (26, 41, 48, 53, 54, 98, 149, 266) and the use of foregone deposits for solid waste programs (98). In particular, none of the municipal or regional district agencies expressed dissent on proposals related to the retention of container return incentives. Caution was advised by local governments against replacement of the existing system in the absence of a proven alternative but that it may be appropriate to remove refunds once an alternative demonstrates equal effectiveness in the control of litter (26, 41, 48, 53, 98, 248, 266, 271, 272).

A submission by the Coalition for Recycling and Litter Control (132) did not simply forward suggestions on the subject, but advanced a specific alternative strategy, partially funded by the Coalition, on condition that refunds on soft-drink containers were abandoned.

The Coalition members contend that the refund system unfairly discriminates against their industries for a number of reasons, the most significant being that soft-drink containers are a very small portion of total litter and a much lesser component of municipal solid waste, collection by curbside programs and drop-off depots can be as effective, refunds are confusing to the public because of arbitrary application, refunds can be manipulated for unfair competition among bottlers and they deprive valuable aluminum from recycling programs. The latter contention extrapolates to a basic incompatibility between refunds and curbside programs and the further suggestion that artificially high values on cans, because refunds exceed the inherent scrap value, promotes unauthorized scavenging of the aluminum from curbside programs.

As an alternative to refunds, the Coalition proposes to commit $5 million over 5 years to:

1. pay one third of the capital cost, including boxes, trucks and basic processing equipment but excluding land and buildings for class-1 multi-material curbside recycling (MMCR) programs, where the municipality and the Province share the remaining cost;

2. pay MMCR launch costs to a maximum of $1 per household in each community;

3. pay one third of the capital costs of the rural and apartment program where the municipality and the Province share the remaining costs;

4. promote the rural recycling and buy-back programs and work to secure corporate sponsors on a local, regional, or provincial basis;

5. for the first three years, pay the costs for an advertising campaign and sponsorship of non-profit groups in support of a comprehensive anti-litter campaign where the Province and the municipalities agree to pay the capital and operating costs of enhanced pick-up programs, litter bin placement and maintenance and enforcement procedures.

A commitment is also included to provide markets for recycled materials generated by the member industries of the Coalition.

8.5 RECOMMENDATIONS

On the issue of container refunds and the effectiveness of the B.C. Litter Act, it must be appreciated that the Act is designed to be an instrument to control litter which blue box curbside programs, since they collect materials from households, obviously cannot address. The issue then essentially devolves to (i) whether beverage containers are a significant component of litter, (ii) whether all litter components are of equal concern

and should the full spectrum be addressed and (iii) if curbside recycling is a desirable management initiative, whether it is compatible with container refunds.

Although, in the context of critical environmental issues, litter may appear somewhat innocuous and trivial, nevertheless, serious students on the subject have developed convoluted methods of analyses and study in appraising litter problems. As a result, a considerable measure of interpretation can be applied to the findings of practical litter surveys such that the results are often inconclusive. The Ministry is satisfied from its perspective, however, that deposit/refunds are effective instruments for the control of litter, that beverage containers and associated wastes can be a significant, persistent and potentially harmful component of litter and, on a perception basis alone, programs must address the full spectrum of litter.

The basis for the Ministry's position is presented in a staff report entitled, "A Review of the British Columbia Litter Act", August 1988, which developed the following specific conclusions:

- Beverage containers are a significant portion of total litter, particularly when litter is measured by its surface area or its volume.

- Beverage containers make up a significant portion of the litter stream in jurisdictions without deposit systems. The importance of the beverage container portion of the litter stream is further enhanced due to their non-biodegradability.

- A deposit system is the most effective means of controlling beverage container litter. However, the evidence as to its effectiveness in controlling non-beverage container litter is inconclusive.

- Deposit systems were developed to control the litter problem which is a distinct and separate problem from that of waste disposal.

- The evidence that general litter control programs are more effective than deposit legislation in controlling all litter items is by no means conclusive.

- No alternative collection system has been shown to be more effective at collecting and recycling beverage containers than has the deposit system. In addition, deposit systems can be used in conjunction with household curbside collection and other recycling programs to effectively reduce both the litter control and solid waste disposal problems.

- The long-run viability of recycling operations would best be served if each material collected covered its share of collection and processing costs and not by relying on one material to subsidize the other materials.

- Market forces in the soft-drink industry appear to be placing the sale of soft-drinks in refillable containers at a disadvantage.

- The manner in which the current refund system for soft-drinks is operating may result in some retailers paying out more refunds than they have collected and in an inequitable distribution of container return handling costs amongst retailers. The first problem could be solved by implementing a mandatory deposit system while the latter problem could be addressed by a retailer handling charge.

- The current return system for beer and cider containers is very effective in maintaining a high container return rate, thus, no changes to the current system for the brewing industry are required.

Two influences are cited for reasons why deposits are incompatible with curbside recycling. Deposits create incentives for containers to be returned for refund rendering them unavailable for blue box recycling. This is generally true, but it is a confusion between the use of deposits to control litter and use of recycling as a cost-effective waste management practice. In that regard, recycling should be viable as a management option

rather than a profitable business propped by fickle commodity markets. Secondly, the artificially high value of deposits relative to the intrinsic scrap value of aluminum in cans, promotes scavenging or pirating to rob curbside programs of the most lucrative materials. While this would appear to be a realistic concern, experience seems to indicate that scavenging is likely to be a problem in any event. Ontario reports that pirating of cardboard has occurred even though beer cans with five cent refunds are recycled in blue box programs. An editorial in the Edmonton Journal cited problems with recyclable bottles and newspaper with that City's curbside program but did not refer to refundable aluminum cans. Oregon's experience has been that containers are largely recovered through deposits and that mixed recovery of recyclables in a single curbside container is a sufficient deterrent to prevent creaming of containers from the program. On the other hand, paper is highly visible and separately packaged at curbside and Oregon has found this component to be the material most frequently subjected to illegal removal.

Acceptance of the Coalition's proposal would leave the following cost items to be funded by the Province and participating municipalities:

a) two thirds of the capital cost of household blue boxes, collection trucks, and basic processing equipment.

b) 100% of the capital costs of land and buildings for recycling processing centres.

c) 100% of the operating costs of curbside recycling programs.

d) two thirds of the capital costs of rural and apartment programs.

e) 100% of the operating costs of rural and apartment programs.

f) 100% of the capital and operating costs of enhanced litter pick-up programs, litter bin placements and maintenance and enforcement procedures.

It is important to remember that the Coalition's proposal is for a five year program after which their involvement would cease. Complete funding of recycling and litter control would then be left with the Provincial and municipal governments. The anti-litter education program proposal is only a three year program as the Coalition believes that curbside recycling will act as the long-term anti-litter mechanism. If this turns out not to be the case then government will have to fund an ongoing anti-litter education and clean-up program.

The Coalition's funding commitment is capped at $5 million although further funding from such organizations as the Grocery Products Manufacturing Council of Canada may be available if the proposal is accepted. No amount is given for the potential further funding except for the statement of "significant resources". Unless further funding is obtained by the Coalition they will most certainly fall short of the funding commitments made in their proposal. Using the capital costs, promotion costs and anti-litter costs provided by the Coalition in its submission the total funds required to meet its commitment would be $7.927 million. This would leave a shortfall of nearly $3 million.

As a further perspective on the funding aspect, it may be useful to compare the B.C. proposal with a similar program already in place in Ontario. The four year participation of the beverage industry is due to lapse at the end of 1991 but a continued commitment is expected although not yet formulated. The Province operates a 4-R program of reduce, reuse, recycle and recover. Its total budget for 1988-89 was $11 million of which $7.7 million was the Ministry's one-third share of the curbside recycling program. Approximately 40% of the eligible population (i.e. centres of over 10,000 people) are now served by curbside collection and a further increase in the Province's funding to $10 million is budgetted for 1989-90. A direct ratio, on the basis of population, would place the cost to the Province of the same program in B.C. in the range of $2.5-3.2 million per year or $12.5-16 million over five years. It is important to recognize also that the Ontario program does not include any anti-litter components.

Apart from the Coalition and its members, no submissions were received by the Task Force to eliminate container refunds. There were, however, consistent appeals for the existing system to be strengthened. In particular, it is noteworthy that the brewing industry values container deposit/refunds and requests that they be retained.

In light of the compendium of views submitted, however, the Task Force was not satisfied that the Ministry's original proposals on beverage container controls addressed a sufficient portion of the litter spectrum. It was evident that non-rigid containers for non-carbonated soft-drinks maintain a significant share in the market and, although impractical to return for refund, they should be recognized as a contributor to litter and be assessed a levy payable towards an anti-litter program. In addition, the suppliers of both convenience food packaging and serving cups for dispensing beverages were considered delinquent in their lack of attention to litter potential offerred by their products.

As a concluding summary, the most significant issue requiring resolution was the offer by the Coalition of funding and suport assistance for a system of container returns to replace refunds. In recommending against acceptance of that proposal, the following factors weighed most prominent in the Task Force's assessment:

- Outside of the Coalition's membership, no regional or municipal authority and none of the general public supported abandonment of refunds.
- Enforcing deposits will correct the increasing weakness evident with non-refillable returns and will level the play-field for competing bottlers and retailers on all soft-drink containers.
- The brewing industry operates as a deposit system and illustrates the improved effectiveness achievable compared to a refund mode.
- Deposit/refund systems have not demonstrated an incompatibility with curbside recycling programs where they have been practised simultaneously elsewhere.
- A deposit/refund system to control container litter can be coupled with a curbside recycling program for landfill diversion and can be more effective in their assigned purpose than either system alone.

- The simultaneous return of containers through depots and recyclers should ease demand on retailers and permits all three systems to demonstrate its effectiveness.
- Mandatory deposits allow for universal return routes by the public since all containers enter the market with a deposit charge in place and can be returned to the bottler, without financial loss, through the most convenient, available avenue.
- Better harmony and more aggressive participation in the return system is encouraged through the payment of handling fees to depots and retailers, and full refund value to recyclers.
- A recycling and anti-litter strategy, as proposed by the Coalition, can be retained as program components and, if properly fostered to demonstrate an effectiveness equivalent to refunds, could eclipse refund requirements in the future.

RECOMMENDATION 44:

The Province maintain a beverage container refund/deposit system. Should curbside collection and rural recycling programs exhibit participation levels indicative of an effective container recovery option, consideration could be given to phasing out refund/deposit requirements.

RECOMMENDATION 45:

The beverage containers included in the refund/deposit system include rigid sealed containers of soft-drinks, fruit drinks, mineral water, water, beer, ale, cider and coolers. Dairy products, non-dairy milk substitutes and fruit juices, defined as a beverage of 85% or more fruit juice, be exempted from the deposit requirement.

RECOMMENDATION 46:

The Province make it mandatory for the bottlers, brewers and import distributors of prescribed beverage containers to collect a minimum deposit on any container sold of 5¢ per container of one litre or less

and 20¢ per container greater than one litre. In addition, it is the bottler, brewer or import distributors' responsibility to collect their containers which have been returned to retailers, depots or recyclers.

RECOMMENDATION 47:

A handling fee of 2¢ per prescribed soft-drink, fruit-drink, mineral water and water container returned be paid to retailers, depots, and recyclers by the bottlers or import distributors for any prescribed soft-drink container returned by a consumer. In addition, any number of containers, purchased through one receipted transaction, can be returned to the same retailer after suitable prior notification has been given.

RECOMMENDATION 48:

A system of bottle depots for the return of all prescribed beverage containers be encouraged in addition to the current return-to-retailer system.

RECOMMENDATION 49:

A tax of 2¢ per container be placed on soft-drink, fruit-drink, mineral water and water sold in non-rigid sealed containers, such funds generated to be used for implementing anti-litter and clean-up programs.

RECOMMENDATION 50:

The Ministry of Environment conduct a comprehensive litter study which should determine:

a) the composition of litter
b) who litters and why
c) the effectiveness of alternative anti-litter strategies
d) the extent of local wine and liquor bottle litter
e) implementation of a Litter Tax

RECOMMENDATION 51:

The Province work with the Governments of the other three Western Provinces to standardize the value of beverage container deposits and to work to have the minimum deposit for containers of one litre or less set at 10¢.

RECOMMENDATION 52:

The Ministry of Environment work with industry to promote the use of anti-litter logos on unsealed beverage containers (eg. disposal cups) and other convenience food packaging.

8.6 LITTER FROM ILLEGAL DUMPING

One other major item of concern, attributable almost exclusively to government agencies, was the need for more effective enforcement and prosecution against littering. In particular, although landfill management can be improved by restricting access to times of manned operation, illegal dumping often proliferates outside the site after the gates are closed.

RECOMMENDATIONS

With regard to the issue of illegal dumping, some suggestion was made to invoke the concept of law referred to as "Presumption". It was this principle written into law which supported the prosecution of speeding offences against the registered owner of a car on evidence provided by the Multanova Camera. However, convictions have had checkered success and in Saskatchewan, for example, the law has been overturned. In addition, there is no vested interest of an owner in the case of waste being dumped and, unlike the automobile situation, the lack of any intrinsic value removes any reasonable presumption of continuing owner responsibility. Circumstantial evidence from inspection of the littered wastes is, nevertheless, useful information from which to launch an investigation into the offence and this

would appear to be the only option available to the Province for the moment. The possibility of an appropriate municipal by-law for litter control, to avoid fine monies being returned to consolidated revenue and, thereby, avail the funds for municipal clean-up, should also receive further attention.

RECOMMENDATION 53:

The Ministry of Environment develop sound investigative measures to control illegal dumping of residential waste in an attempt to establish good precedents for laying successful charges and consult with the Ministry of Attorney General in drafting legislation to facilitate the prosecution of littering offenders.

SECTION NINE

PACKAGING

9.1 INTRODUCTION

There is a wide variety of ways by which waste streams may be analyzed. The formulation of the solid waste questionnaire responded to by B.C. municipalities for calendar 1986 included information on residential and commercial sources and on the generic composition of the wastes by glass, paper, organics, etc. However, no break-down involving the percentage contribution from packaging was requested and therefore, there is not current information specific to British Columbia on the volume of packaging in municipal wastes.

On the basis of earlier studies conducted by Energy, Mines and Resources Canada and by Middleton Associates, it might be expected that more than 30% of residential solid wastes consists of packaging materials. There is a further conjecture that 90% of all packaging ultimately is wasted.

Possibly the most difficult aspects of successfully controlling packaging wastes are the shear volume and variety of the waste types involved, their production driven by a mixture of product need and consumer demand, and the national or even international scope which packaging can embrace.

9.2 BACKGROUND

No specific proposals were contained in the Ministry's Dicussion Paper for addressing the issue of packaging except that the need for a research study was identified to examine consumer product packaging as a key growth component in municipal solid waste.

9.3 EXAMPLES FROM OTHER JURISDICTIONS

There is no common or concise approach among jurisdictions on the means by which the minimization of packaging wastes could be effected. Nevertheless, there are a limited number of controlling factors which fundamentally relate to reduction, reuse and recycling. Aspects of environmental compatibility on the disposal of packaging are also involved featuring by-product escape, as with incineration, and the degradability of materials once landfilled or littered. These might be achieved through incentives or disincentives at the production stage, by legislation at the appropriate government level or through consumer education programs. In some instances, the practices adopted would be uniquely tailored to the individual jurisdiction but, considering the ubiquitous nature of packaging, more unilateral policies would likely be better suited to produce the desired results.

9.4 PUBLIC DISCUSSION

A clear message was received from the public for more control to be exercised on product manufacture and for the promotion, in various forms of packaging which is demonstrated as being environmentally sound (2, 3, 14, 22, 26, 30, 36, 42, 43, 46, 49, 59, 75, 76, 77, 79, 80, 93, 98, 114, 124, 133, 137, 143, 252, 256, 261). Packaging which is not recyclable should be advertised as such and should then be degradable. Paper substitutes are preferable to plastics and the latter should be non-toxic when incinerated or buried (30, 49, 59, 98, 124). The use of styrofoam products was also harshly criticized (22, 42, 77, 143). Packaging manufacturers, it was suggested, should bear some portion of disposal costs incurred through provincial taxation (8, 26, 259). Some concern was also expressed about our knowledge of the end products of biodegradable and photodegradable plastics (43, 75, 130).

A common view expressed by the public was that consumers had no choice in how products were packaged and were forced to accept the packaging materials put on the market. On the other hand, producers claimed that their choice of packaging materials was determined solely by consumers, who

can "vote with their wallets". The truth obviously lies between these two extremes. Producers will use what consumers will accept but not necessarily want, while consumers, because they are not united, are individually powerless. Hopefully, the consumer education program recommended in Section 7.3 can show consumers the true market power they possess. An example of this power was the recent decision by a major fast-food chain to stop using plastic foam containers because of public concerns over the chloro-fluro carbons (CFC) used in the containers' production.

Another strong theme which was evident was the need for senior government leadership in controlling packaging and for the Province to prompt and liaise closely with national programs (14, 36, 46, 75, 76, 77, 80, 133, 137). Strong support for the federal "Environmentally Friendly Packaging" program was received (3, 14, 75, 76, 77).

The brief from the Society of Plastics Industry of Canada stated that their society now "embraces the principle that the plastic industry accept stewardship for its products throughout their life cycle" (130). Furthermore, their society plans to establish a "plastic waste management council".

9.5 RECOMMENDATIONS

It is apparent that the Ministry needs to establish the contribution of packaging provincially to the residential waste stream through research. The legislative, education and other needs will require annual review and close liaison established with industry to foster its stewardship over the lifetime of the products manufactured. One opportunity to increase the profile of packaging concerns and to lend support to a national initiative would be to become actively involved in Environment Canada's Environmentally Friendly Products Program. This campaign is targetted to help consumers identify products and packaging which, during use and disposal, are environmentally compatible. Continuing interface with national programs can be maintained through the Canadian Council of Resource and Environment Ministers (CCREM). The ultimate goal of British Columbia's participation

would be the development of a national approach to optimize the management of packaging and municipal wastes generally. From a provincial viewpoint, the possibility obviously exists for immediate gains in the substitution to paper-based packaging in a selection of consumer products.

RECOMMENDATION 54:

The Minister of Environment, through the Canadian Council of Resource and Environment Ministers, advance as quickly as possible the development of a national strategy for the reduction of packaging materials and other wastes.

RECOMMENDATION 55:

The Ministry of Environment promote to industry the principle of "designing for recyclability". That is, that manufacturers when designing a product strive to ensure that their consumer products are able to be safely and economically recycled using existing recycling technology and methods. In British Columbia, the immediate potential for paper substitutes in egg cartons, fast-food clam-shells, etc. should be considered.

SECTION TEN

SPECIAL WASTES IN THE MUNICIPAL WASTE STREAM

10.1 INTRODUCTION

A wide range of consumer products can pose potential hazards to the environment and public health if improperly disposed. These materials include antifreeze, disinfectants, cleaners, pesticides, paints, solvents, preservatives, used motor oils, medicines and many more. Increasingly, dedicated programs are being implemented to ensure safe segregation and handling of household hazardous wastes.

Another category of waste liable to enter the municipal waste stream can be broadly described as biomedical waste. Problems involving the management of these wastes have been increasingly observed by the public, waste administrators and the regulatory agencies. In response, more attention is being paid to the development of suitable management strategies emphasizing the need for consistent segregation practices by the generator and the application of appropriate treatment technologies depending on the particular type of waste being handled. It is fair to say, however, that the actual hazard posed to the environment and public health from biomedical wastes versus the perception of a hazard existing, is not technically well defined.

10.2 BACKGROUND

No proposal was presented in the Ministry's Discussion Paper pertinent to the management of municipal special wastes or biomedical wastes. Both topics were represented in submissions to the Task Force as items requiring address within a comprehensive Province strategy for the management of municipal solid wastes.

10.3 EXAMPLES FROM OTHER JURISDICTIONS

Collection programs to segregate special household wastes from the residential stream are designed to provide for safe removal, transportation, storage and/or disposal. Collections can be made in isolated events or as an on-going service by the municipality or contracted organizer. In many programs residents are encouraged to take their special wastes to a designated depot where the materials are classified, packed and shipped. To a lesser extent, a special door-to-door collection can be provided, in addition to the necessary control depot facilities. In some cases, where curbside recycling is in operation, the household collection of selected special wastes can be piggy-backed into that system. Mobile depots offer a further modification.

TABLE 10-1
LOCAL HOUSEHOLD HAZARDOUS WASTE COLLECTION PROGRAMS OPERATING IN THE U.S.A, OCTOBER 1987

STATE	NUMBER OF PROGRAMS
Massachusetts	208
California	150
Florida	70
New York	64
Connecticut	59
New Hampshire	36
Michigan	33
Washington	29
Wisconsin	26
Minnesota	25
Nebraska	10

Source: Arner, 1988.

The control of biomedical wastes is almost universally in a state of flux. Ontario is the only Province with specific legislation.

10.4 PUBLIC DISCUSSION

With respect to residential special wastes, comments shared a common recognition that some form of program was needed to help remove these discharges from collection systems for general municipal wastes. Some specific suggestions included provision of storage depots (30, 35, 46, 98, 261), standardizing signs warning about illegal landfill discharges (251, 256), return of containers for special wastes to the manufacturer (8, 46, 245), more enforcement (41, 48, 53, 54, 266), product taxes (245) and increased public awareness campaigns (98, 149). While not a solid waste, used oil is often destined for landfill disposal and an alternative option should be made available. Biomedical and other problem institutional wastes were also suggested to be removed from municipal collection systems (20, 41, 53, 149, 245, 266, 272).

Underlying the comments urging the removal of these wastes from general collection was the expressed priority for the establishment by the Province of a treatment and disposal facility for special wastes at the earliest date possible (41, 48, 53, 149, 271, 272). An added concern mentioned was over the long-term liability for any damage to the environment as a result of spill clean-up material being directed to municipal landfills.

10.5 RECOMMENDATIONS

Since early in 1988, the Ministry of Environment has been cooperating with the private enterprise, B.C. Special Waste Services Inc., developing a proposal to establish a special waste facility in the Province. A facet of that proposal involves a collection system, operated in conjunction with local municipalities, to remove household special wastes from the garbage stream for appropriate treatment. The last attempt to site a suitable facility was abandoned when opposition from the intended host community in the Ashcroft-Cache Creek area became irreconcilable. The Ministry

recognizes, however, that the need for treatment of these wastes has not diminished and continues to explore the potential for other locales in the Province as well as joint options which may be afforded through collaboration with the Alberta or Federal governments.

The Ministry currently operates eight regional storage depots accepting special wastes from small quantity generators. For safety and as a result of some jurisdictional agreements, radioactive and explosive wastes are handled by other means as are pathological and biological. Shipments of the accumulated materials are arranged by the Ministry, as necessary, to disposal facilities outside the Province. PCB's are the exception which, in the absence of disposal options being available, may only be securely stored. The capacity of existing depots is often strained and an aggressive education campaign encouraging householders to divert special wastes from the garbage stream would need to be accompanied by an expansion of the storage capacity available. Passing the control of the additional depots to local authorities wishing to establish such programs will involve personnel training for both storage and collection as an essential element in the implementation of the initiative.

Since used oil is estimated to constitute more than one third the volume of all special wastes in B.C., municipalities could be greatly assisted and the environment readily protected by the installation of storage tanks for oil, either at the landfill, the municipal works yard or other convenient location. The capability to treat the collected oil to a reuseable product is already in place in the Vancouver area of the Province and a far-reaching collection system to service the tanks is in operation.

In British Columbia, the severely infectious component of biomedical wastes are controlled by Regulation pertinent to the Transportation of Dangerous Goods Act. However, controlling the total category of these wastes is a complex issue starting with the definition of which waste types warrant priority concern, their method of segregation, appropriate means of handling and treatment and acceptable disposal technologies for each waste grouping. In this regard, a separate Task Force was struck by the

Ministries of Environment and Health, and a comprehensive report recommending short and long-term initiatives for the control of biomedical wastes has been submitted for Executive consideration as of December, 1988.

RECOMMENDATION 56:

The Province treat the location and development of a provincial special waste treatment and disposal facility as an urgent priority.

RECOMMENDATION 57:

The Province fund 1/3 of the cost of building and site preparation of a facility for the storage of special wastes diverted from the municipal solid waste stream in communities which wish to establish such programs.

RECOMMENDATION 58:

The Ministry of Environment produce a household special waste collection manual for use by participating local governments and conduct personnel training courses on the handling and storage of such wastes.

RECOMMENDATION 59:

The Province accept responsibility for the disposal of any potential special wastes which it requested a municipal facility to accept.

RECOMMENDATION 60:

The Province fund 1/3 of the capital costs of waste oil storage containers at municipal waste disposal facilities.

RECOMMENDATION 61:

The Province, on the basis of the Biomedical Task Force report, adopt a strategy for the control of these wastes and collaborate with regional governments on the need and feasibility of integrated management systems.

SECTION ELEVEN

OTHER WASTE PROBLEMS

11.1 INTRODUCTION

During the public review, a number of concerns were raised which have not been addressed in the Ministry discussion paper. Many of these are localized problems, but nonetheless, require attention. These include:

- white goods;
- fish farms and animal carcasses;
- demolition material;
- septic waste; and
- marine litter.

11.2 WHITE GOODS

There are concerns about the removal and handling of chemical elements such as freon, mercury and ballasts from these appliances - and whether these elements require handling as special wastes (1, R.D. Fraser Ft. George, D. Hoffman, 64). The scrap metal market for white goods is weaker than for automobiles, no viable British Columbia market currently exists, and scrap revenues are insufficient to recover handling and transportation for Lower Mainland white goods (Delta Recycling Society). In addition to Task Force recommendations about marshalling rural area white goods to central collection points (recommendation 33), there is a proposal to coordinate a used appliance parts network in British Columbia (74). At present, white goods separated for recycling are simply piling up - and most white goods appear destined for landfill disposal.

RECOMMENDATION 62:

That the Ministry of Environment develop a clear policy for landfill operators and scrap metal dealers about handling and disposing of

white goods and the special waste status of component chemicals. In addition, white goods should be a priority for the market development activities of the proposed Solid Waste Management and Recycling Section.

11.3 FISH FARMS AND ANIMAL CARCASSES

The number of fish farms has increased rapidly in the past several years. Most operations are located in remote areas along the east side of Vancouver Island and the opposite mainland coast - a number of which are only accessible by boat. At present, fish mortalities are disposed of in a number of ways, including deep water dumping, in permitted landfills, and non-permitted disposal to land. There are concerns that improper disposal to the marine environment may introduce disease to wild fish stocks, or affect marine or shoreline recreation and aesthetics (120, 122). Improper land disposal may invite bear problems or contribute to human health impacts. Improper land disposal of livestock carcasses and remains of hunting kills could also contribute to bear problems or human health impacts (Peace Liard Regional District, 29, 45). The fish mortality issue is addressed in the recently-issued Environmental Monitoring Guide and rendering may offer an attractive economic opportunity. Guidelines for animal carcasses should also be developed.

RECOMMENDATION 63:

The Ministry of Environment and the Ministry of Agriculture and Fisheries should examine the problems of fish farm wastes and animal carcass disposal and provide recommendations for their correction.

11.4 DEMOLITION MATERIAL

Demolition material, construction site waste and land clearing debris is largely wood-lumber, as well as tree stumps and branches, although it also includes rock, concrete, glass, metal and other building materials. Being relatively inert, this material does not create environmental impacts. This material quickly exhausts landfill space - an undesirable characteristic in community landfills. There are opportunities to compost

or grind up wood for hog fuel (1, Rod Grimm) - a factor to be included in the waste management plans prepared by local government.

RECOMMENDATION 64:

The Ministry of Environment work with local government to develop alternative methods of handling woodwaste from demolition and land clearing wastes (eg. chipping and composting, etc.)

Private landfills on industrially-zoned lands may welcome demolition waste as inexpensive fill, to more quickly realize future industrial development potential of the site (T. Anderson). However, these operations need to be included within Waste Management Plans and carefully monitored. without careful monitoring, however, the composition and construction of these private landfills may compromise industrial development potential. For example, mixing other wastes with the demolition waste could potentially preclude future development of these sites.

RECOMMENDATION 65:

The Ministry of Environment work closely with local government and private landfill operators to monitor the construction and composition of sites intended for future industrial development.

Gypsum wallboard is a constituent of this demolition material which is not inert - and its high sulphur content can leach into ground or surface water from landfills, or be released into the air as sulphur dioxide if burned. Gypsum wallboard can be recovered for remanufacturing as is being done on a commercial scale in the Vancouver area (100). Significant volumes are in the waste stream, and should be diverted. This may be an additional candidate for a product disposal charge (see Section 12.4).

RECOMMENDATION 66:

The Ministry of Environment work closely with local government and the construction industry to reduce volumes of gypsum wallboard

being disposed of in landfills or offshore and recycling would be encouraged.

11.5 SEPTIC WASTE

During the Task Force public meetings, it was reported that some septic tank trucks and pesticide trucks empty their load or wash out their trucks at local landfills (1, D. Hoffman). There was also speculation about illegal dumping by septic tank trucks (29). These are factors which need to be considered in the solid waste management plans for rural areas as they could have environmental and human health impacts.

11.6 MARINE LITTER

Marine litter, especially plastic, can persist in the environment and is part of the litter problem (83, Prince Rupert meeting, Nanaimo meeting). Litter comes from commercial and recreational marine traffic, discarded along shorelines, feed bags from fish farms, airborne material from other areas, and can be associated with sewage discharges to the marine environment. This marine litter can affect wildlife as well as reduce the recreational and aesthetic enjoyment of residents and tourists. In particular, the hi cone can plastic rings can strangle birds, while ingesting plastics can kill birds or marine mammals. Discarded plastic bags and drift nets can entrap marine wildlife before finally coming ashore. The experience of other jurisdictions, such as Washington State and Texas can contribute to the development of solutions for British Columbia.

RECOMMENDATION 67:

The Ministry of Environment in conjunction with the federal Department of Fisheries and Oceans should examine the problem of marine litter and adopt necessary measures to combat the problem.

SECTION TWELVE

FUNDING SOLID WASTE MANAGEMENT

12.1 INTRODUCTION

The means by which solid waste management costs should be funded was perhaps the most controversial topic the Task Force had to deal with. This was especially true for the Task Force's discussions with local governments.

12.2 WHO SHOULD PAY

In its discussion paper the Ministry of Environment expressed the view that it is the waste generator who should bear ultimate responsibility for the safe disposal of his or her waste products. As such, the revenues necessary to fund solid waste management should ultimately come from waste generators and not from general government revenue at either the provincial or local level. To do otherwise, it was stated, would mean the general public would be subsidizing the waste disposal costs of waste producers. Under these circumstances the waste producers would have no incentive to either reduce or eliminate their waste production nor to find alternative waste disposal methods.

The Ministry of Environment's view is consistent with the "polluter-pays principle" adopted by all member nations, including Canada, of the Organization for Economic Cooperation and Development (OECD, 1975). In its guiding principles, the OECD states:

> The principle to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment is the so-called "Polluter-Pays Principle". The Principle means that the polluter should bear the expenses of carrying the above mentioned

measures decided by public authorities to ensure that the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption.

There was surprising public support for the polluter-pays principle (14, 16, 65, 74, 75, 76, 137, 143). Many simply believed it was right for every business and household to be paying for waste disposal in accordance with the volume of wastes they produce rather than the common practice for a flat rate fee. Others believed that it would encourage business and household recycling.

The Task Force agrees that the polluter-pays principle is the correct approach to funding solid waste management. However, the immediate and full implementation of this principle will prove difficult. Instead, the Task Force believes that this funding approach should be phased in over time by all levels of government.

RECOMMENDATION 68:

The Province adopt the polluter-pays principle as its long-term approach to waste management funding.

12.3 PROVINCIAL WASTE DISPOSAL SURCHARGES

Waste disposal surcharges are an additional fee added on to the tipping fees charged at waste disposal facilities such as landfills or incinerators. While they are not known to be used by any province in Canada, their use is growing in the U.S.A. where states are implementing them to pay for state waste management programs.

EXAMPLES FROM OTHER JURISDICTIONS

The State of New Jersey implemented a $1.50/ton tipping fee surcharge at its waste disposal facilities, both landfills and incinerators, in 1987

(New Jersey Department of Environmental Protection, 1987). The revenues raised by the surcharge are put into the State's Recycling Fund which finances the majority of the state recycling program costs. Illinois has a waste disposal surcharge, called a Recycling Grant Fee, of 95¢/ton or 45¢/cubic yard of wastes. Colorado has imposed a 5¢/ton state superfund surcharge to help pay for the clean-up of hazardous waste sites. Wisconsin has a 15¢/ton surcharge for its Environmental Repair Fund. The Oregon legislature will be considering during 1989 a recommendation from its Department of Environmental Quality to impose a $2/ton landfill surcharge (Resource Recycling, 1988). It is proposed that half of these funds be returned directly to local governments to help fund their waste reduction and recycling programs. Similar measures are under consideration in California, Pennsylvania and Ohio.

THE MINISTRY'S PROPOSAL

In its discussion paper, the Ministry of Environment proposed to implement a provincial landfill tipping fee surcharge in the range of $1 to $3 per tonne. For landfill sites which do not measure their wastes, the tipping fee would be based on the maximum permitted daily discharge rate. The revenues derived from the proposed surcharge would only have been used to fund the solid waste management support programs proposed in the Ministry's discussion paper. It is expected that the proposed surcharge depending on the fee selected would raise between $1.5 to $6.6 million annually.

The public's reaction to the Ministry's landfill surcharge proposal was almost equally divided between those for (45, 75, 76, 77, 79, 101) and those against (16, 65, 74, 81, 91, 106). It was also suggested that the surcharge be applied to all waste disposal facilities rather than just landfill sites (75, 76). Those against the surcharge viewed it as "a provincial tax grab of municipal money" (81).

Municipal opposition to the proposed landfill tipping fee surcharge was intense (2, 12, 13, 19, 20, 26, 30, 55, 62, 109, 120, 124, 149, 244, 245,

247, 248, 252, 253, 255, 259, 261, 272, 273). Local governments outside of the lower mainland area felt the revenues collected would be diverted to pay for projects in the lower mainland while local governments in the lower mainland felt exactly the reverse would be true (30, 46, 149, 244). Several local governments felt that it would be impossible to collect tipping fees at their waste disposal sites (30, 46, 149, 244) while others said that any attempt to collect tipping fees would result in increased illegal dumping of wastes in rural areas (26, 30, 124, 247, 259). Many rural communities said they should be exempted from the tipping fee surcharge because they felt that they would not benefit from any of the programs proposed in the Ministry's discussion paper (8, 19, 247, 255, 262, 263, 264, 269, 273). A view frequently expressed was that the surcharge proposal was simply one level of government taxing another. Several communities called for direct provincial funding assistance for solid waste disposal similar to that received for sewerage facilities (13, 109, 120, 124, 245, 247, 260, 261). Other communities suggested that another mechanism for raising funds for waste disposal should be used such as product charges or a 'waste initiators tax' (2, 55, 245, 261). There was some support for the surcharge proposal, however, the support was always qualified with the statement that any funds collected should remain within the local jurisdiction (39, 46, 48, 110). It was also suggested that any tipping fee surcharge should be applied to incinerators as well as landfills (46, 149).

A common thread to all of the local government briefs was that the funds should be left in the local communities as they knew best how to use the funds rather than have it administered by a central bureaucracy. The Task Force is sympathetic with this view but notes that currently, with a few exceptions, little is being done across the province to promote alternative disposal options. The programs recommended in this report are a significant expansion over the programs proposed in the Ministry's discussion paper and provide for special support to rural area waste management. These programs will require additional provincial funding over and above the amount collected by any tipping fee surcharge. In addition, this report contains recommendations for programs which are province wide by nature which should benefit all areas of the province. As such, the Task Force believes that it is reasonable for some portion of the funds required

to implement a provincial solid waste management strategy be collected from waste generators through a waste disposal tipping fee surcharge. To start with, the tipping fee should be a modest one, thus giving local governments an opportunity to develop and implement their own programs. However, the Minister of Environment should consider increasing the tipping fee surcharge in any area of the province which does not make a commitment to implement sound solid waste management practices.

RECOMMENDATION 69:

A provincial tipping fee surcharge of $0.50 per tonne be levied on all landfill and incinerator operators in British Columbia. The requirement for maintaining the surcharge is to be reviewed every five years.

12.4 PRODUCT CHARGES

A product charge is defined as an excise tax on the material content of consumer products entering the waste stream. The concept is that the end users of a product should have included in its price the cost of collecting and disposing of the discarded product and its associated packaging materials. Product charges are usually used for goods which pose particularly difficult disposal problems. Automobile and truck tires are a case in point. Tires when landfilled tend to float up through the landfill and discarded tires stockpiled on the surface collect pools of water which serve as a breeding ground for insects and may present a fire hazard.

EXAMPLES FROM OTHER JURISDICTIONS

At least three U.S. states have implemented a product charge on the sale of replacement auto and truck tires; Wisconsin at $2 per tire, Oregon at $1 per tire and Florida at 50¢ per tire. The revenues from the fee will be used to fund scrap tire recovery and the clean-up of used-tire stockpiles. Although not strictly a disposal charge, Rhode Island has imposed a $5 deposit on new lead-acid batteries sold in the state in order to facilitate the recovery of the batteries. Minnesota is considering a

proposal to implement a disposal charge on fast-food packaging of 1¢ per package. Florida has also implemented a 10¢ per ton "advanced disposal fee" on newsprint sold in the state. If the recycling rate for newsprint in Florida does not reach 50% by October 1, 1992, the fee will rise to 50¢ per ton.

Some jurisdictions have or are moving toward including a wider group of products. In 1971, Washington State passed the Model Litter Control Act which contained provisions for a litter tax on items manufactured or sold in the state which contributed to the litter stream. The tax is 0.015 of 1 percent of the value of the item sold. The tax is assessed on industries "... whose products, including the packages, wrappings and containers thereof, are reasonably related to the litter problem" (section 70.93.130 of the Act). Industries included under this provision include: packaging, beverage, food and grocery, drug, newspaper and magazine industries. In 1977, the litter tax raised $1.2 million which was directed at programs to reduce the litter problem. Nebraska and Virginia have also implemented similar measures. Other states, such as New York, propose to introduce a "waste initiator's tax" which would be based on the material content and recyclability of non-food packaging.

THE MINISTRY'S PROPOSAL

The Ministry of Environment stated in its discussion paper its belief that the use of product charges is justified for products which present particularly difficult disposal problems. The discussion paper proposed to study which products presented such a disposal problem and to implement an appropriate surcharge. The revenues generated by the surcharge, it was stated, would be used to assist municipalities in the disposal of the problem products.

Public reaction to the Ministry's product charge proposal was quite favourable (3, 16, 42, 45, 65, 74, 75, 77, 80, 106, 137, 143, 145). The general view was that the more difficult it was for a product or its packaging to be reused or recycled, the higher the product charge should be.

Packaging material, in particular, was identified as a target for a product charge (65, 75, 77, 143). However, one person felt that rather than an excise tax which would be passed on to consumers, a tax on the profits of business which produce materials that go into the waste stream should be used (36). Aside from car batteries and tires, identified in the discussion paper as likely candidates for product charges, other products suggested include plastic milk jugs (42), disposable diapers (42, 77), styrofoam containers (77) and solvents and automotive fluids (143). The revenues from these product charges, it was suggested, should be returned to local governments to fund recycling programs (16).

The municipal reaction to the product charge proposal was one of general support (2, 19, 26, 31, 35, 48, 49, 98, 248, 261) although there was some opposition (149, 244, 254). Local governments generally viewed product charges as a preferred mechanism for funding provincial waste management programs than tipping fee surcharges. Opposition centered on concerns over increasing consumer prices. Suggested products to which a disposal charge should be added included tires (48, 261), containers (49), wine and spirit bottles (31), plastic milk jugs (39), disposable diapers (26) and household appliances - white goods (248, 261).

The Task Force believes that product charges are an excellent means of collecting funds to pay for the disposal of problem products. The use of product charges to pay for disposal costs would be completely in accordance with the polluter-pays principle recommended earlier. Unfortunately, while there was considerable discussion at the public meetings on the principle of using product charges, little information was generated on which products should be charged, what level the charge should be set at and how the charge would be collected. Thus, the Task Force believes that further discussions with local governments and industry are required before appropriate product charges can be put in place.

RECOMMENDATION 70:

The Province implement product charge excise taxes on difficult to dispose of products and the Ministry of Environment develop by

January 1, 1990, a list of products to be taxed and the recommended tax level for each product.

The Task Force also believes that product charges offer a potential method for funding the disposal of some special waste materials. The inclusion of the cost of disposal into the price of special waste materials sold in B.C. means that users of these materials would have no financial incentive to illegally dispose of special wastes as the disposal had already been paid for. The product charge by increasing the price of the material should also act to lower the demand for the materials.

RECOMMENDATION 71:

The Province examine the use of product charge to pay for the disposal of special wastes in British Columbia.

12.5 MUNICIPAL USER CHARGES

In its discussion paper, the Ministry of Environment promoted the use of municipal user fees to pay for the costs of municipal solid waste management. The paper argued that waste generators would be provided with a powerful incentive to decrease their waste production if municipalities fully charged back to the waste generators the total cost of waste collection and disposal. The first step would be for landfill operators to implement tipping fees based on the true cost of landfills. The second step was for municipalities to develop user charges based on the quantity of wastes collected. The Ministry proposed to assist municipalities by undertaking a review of municipal solid waste user charge options.

This proposal did not generate a great deal of public comment, perhaps because they were unsure as to how municipal user fees would operate. However, there was some support for the proposal (3, 45, 75, 77, 143). One person suggested that there be a dual garbage collection rate - one for regular garbage pick-up and a lower one for garbage from which any recyclable materials had to be separated (3). Another believed that any

attempt to base user fees on the volume of material collected from households would be a management nightmare in smaller communities (106).

Many local governments were silent on the Ministry's proposal to encourage the use of municipal user fees to fund solid waste management. Perhaps this was due to uncertainty as to how the user fees could be effectively administered. Certainly, those local governments which expressed opposition to the proposal did so because they viewed the use of municipal user fees as too administratively complex (30, 62, 149, 244, 247, 254). Some were also concerned that user fees could result in increased illegal dumping (55, 244). However, there was also municipal support for the concept (38, 98, 110, 253).

EXAMPLES FROM OTHER JURISDICTIONS

The Ministry's discussion paper cited the case of Seattle which has a variable can rate for waste collection. In Seattle, residents are required to use a special 90 gallon garbage container. Households are charged $13.55 (U.S.) per month for the first container collected and $5 more for each additional container. This charge provides households with a financial incentive to take part in curbside recycling programs and to undertake backyard composting in order to minimize their waste production. The program has been so successful that the City's solid waste utility will be introducing a new mini-can rate.

Table 12-1 provides examples of twelve other U.S. communities which use variable rate disposal charge systems (Sproule and Cosulich, 1988). In these systems, residents must purchase either specially marked garbage bags or tags which must be attached to garbage bags or cans set out for collection. High Bridge, New Jersey, started their variable disposal rate system in January 1988 along with a voluntary drop-off recycling program. In its first two weeks, the two measures were credited with a 41 percent reduction in residential waste collection. Woodstock, Illinois, credits its curbside collection program and its variable rate system with a 14 percent reduction in the residential waste stream. Perkasie, Pennsylvania, replaced

a flat rate of $120 per household with a variable rate and a curbside collection program which reduced residential wastes by 61 percent during the first half of 1988. In 1970, San Francisco, which had a variable solid waste charge system, had a per capita waste generation rate of 699 lbs as compared to 937 lbs for other California communities without a variable charge system (Albrecht, 1977).

The Task Force is convinced that solid waste user fees based on the quantity of wastes generated can play an important role in municipal solid waste management. The examples of user fees given above are not administratively complex, yet the user fees when combined with recycling programs achieved substantial results.

RECOMMENDATION 72:

The Ministry of Environment produce a review of municipal solid waste user charge options and encourage local governments to implement solid waste user fees wherever feasible.

12.6 A SUMMARY OF PROGRAM EXPENDITURES

Table 12-2 provides estimates of the provincial expenditures required to fund the programs recommended in the provincial strategy. The estimates should be treated with some caution as it is not known how municipalities and industries will respond to the programs. A total of $27.2 million is the estimated provincial cost over the five years.

The provincial strategy also recommends provisions for raising revenues. The 50¢/ton waste disposal surcharge should generate approximately $1 million annually while the 2¢ per container tax on tetrabrick type soft-drink containers should raise approximately $800,000 annually. Together, these two provisions should generate $9 million over the five-year life of the program. The product charges could also generate substantial revenues, however, it was recommended that these funds be used to pay for the disposal of the problem goods.

It would be most unfair if the programs recommended in the provincial strategy did not recognize and reward, to some degree, the past efforts of local governments which have implemented recycling and other alternative waste management programs. The Task Force believes that the programs should be made retroactive to January 1, 1988, so recently established municipal programs can receive the same support as new programs will.

RECOMMENDATION 73:

The Province make all municipal support program funding retroactive to January 1, 1988.

TABLE 12-1
EXAMPLES OF VARIABLE RATE DISPOSAL CHARGE SYSTEMS

COMMUNITY	TYPE OF CONTAINER	VARIABLE CHARGE	MINIMUM FEE
High Bridge, NJ	25 lb. bag or can	$1.25	$35.00
Newport, NY	32 gal. bag	$1.40	
	28 gal. bag	$1.00	
Woodstock, IL	32 gal. bag	$1.12	
Latrobe, PA	bag	$0.25	$60.00
Perkasie, PA	40 lb. bag	$1.50	
	20 lb. bag	$0.80	
Carlisle, PA	30 gal.	$0.85	
	15 gal.	$0.50	
Holland, MI	30" x 39" bag	$1.30	
Grand Rapids, MI	30 gal. bag	$0.30	1.1 mil. on property
	can tags	$0.25	tax
Lansing, MI	30" x 37" bag	$0.70	
Illion, NY	30 gal. bag	$1.15	
	16 gal. bag	$0.85	
Plantation, FL	32 gal. bag	$0.80	
Diluthe, GA	33" x 37" bag	$0.30	

Source: Sproule and Cosulich, 1988.

TABLE 12-2

ESTIMATED PROVINCIAL SOLID WASTE MANAGEMENT EXPENDITURES

ITEM	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTALS
Solid Waste Management Planning Grants	875,000	875,000	-	-	-	1,750,000
Research Studies	300,000	-	-	-	-	300,000
Municipal Solid Waste & Recycling Section	400,000	400,000	400,000	400,000	400,000	2,000,000
University Chairs in Solid Waste Management	30,000	30,000	30,000	30,000	30,000	150,000
Recycling and Composting Capital Grants						
a) 100% of Household Containers	2,000,000	2,000,000	2,000,000	1,000,000	1,000,000	8,000,000
b) 1/3 of Capital Equipment	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
c) 1/3 of Apartment Containers	100,000	100,000	100,000	100,000	100,000	500,000
d) 1/3 of Rural Drop-Off Containers	100,000	100,000	100,000	100,000	100,000	500,000
e) 1/3 of Composters (up to $20 each)	100,000	100,000	100,000	100,000	100,000	500,000
f) 50% of Promotion Costs	100,000	100,000	100,000	100,000	100,000	500,000
Total	3,400,000	3,400,000	3,400,000	2,400,000	2,400,000	15,000,000
School Recycling Program	10,000	10,000	10,000	10,000	10,000	50,000
Recycling Hotline	25,000	25,000	25,000	25,000	25,000	125,000
Waste Exchange	25,000	25,000	25,000	25,000	25,000	125,000
Recycled Product Research and Development	200,000	200,000	200,000	200,000	200,000	1,000,000
Rural Transfer Station Capital Grant	400,000	400,000	400,000	400,000	400,000	2,000,000
Rural Auto Hulk and White Good Collection	100,000	100,000	100,000	100,000	100,000	500,000
Recycling and Packaging Education	200,000	200,000	200,000	200,000	200,000	1,000,000
General Anti-Litter Program	200,000	200,000	200,000	200,000	200,000	1,000,000
Litter Study	100,000	-	-	-	-	100,000
Special Waste Storage Sites	1,000,000	500,000	500,000	-	-	2,000,000
Waste Oil Storage Containers	20,000	20,000	20,000	20,000	20,000	100,000
TOTALS	7,285,000	6,385,000	5,510,000	4,010,000	4,010,000	27,200,000

SECTION THIRTEEN

FINAL COMMENTS

13.1 COMMENTS ON THE PUBLIC REVIEW PROCESS

The final comments of this report deal not with the recommendations which make up the proposed provincial strategy for managing municipal solid wastes but rather the process by which the strategy was developed. The process started with the Ministry of Environment preparing and releasing background reports which gave the Task Force and other interested parties much of the information base needed to start the discussion on solid waste management. The release of the Ministry's discussion paper served to focus public attention on the options available and provided a sounding board for the public to react with. Even though the discussion paper received some harsh criticisms, it served its purpose as a vehicle to stimulate public discussion, and the Ministry should not be reluctant to release discussion papers on other environmental issues. The Task Force's tour which followed the release of the discussion paper, while grueling on its members, allowed for widespread public participation throughout the province. Many communities, especially in the north, were simply gratified that someone from government had taken the effort to ask for their opinions. The Task Force was impressed by the many excellent ideas and suggestions brought forward by the general public, local governments and businesses which helped to form the provincial strategy contained in this report. In summary, the Task Force believes that the public review process was an excellent means of developing solutions to solid waste management problems and believes that it could be used to seek solutions to other environmental problems.

RECOMMENDATION 74:

The public review process used in preparing recommendations to the Government on British Columbia's solid waste problems be an option to seek solutions to other environmental problems.

RECOMMENDATION 75:

Any future environmental task force consider including both political representations, preferably a member of the Legislative Assembly, and technical staff from the Ministry of Environment.

13.2 PUBLIC EXPECTATIONS

A potential drawback to a public review process is that by drawing attention to an environmental concern, a public expectation is created that the problem will be quickly addressed. Any long delays in deciding on solutions or, more importantly, in implementing solutions will lead to growing public cynicism and mistrust. The Task Force believes that this problem could be avoided if the public is informed of the time frame in which any recommendations accepted by Government will be implemented.

RECOMMENDATION 76:

The Ministry of Environment expeditiously prepare an action plan detailing how and when the Ministry will implement those recommendations of this report which are accepted by Government.

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APPENDIX ONE

TERMS OF REFERENCE

Appointment of Task Force

I hereby appoint Mr. James Rabbitt, MLA Yale-Lillooet to chair a Task Force on municipal solid waste management in British Columbia.

The Terms of Reference call on the Task Force to provide adequate opportunities for municipal and regional governments, industry, organizations, and individuals to participate in the development of a provincial strategy for municipal solid waste management.

In conducting its review, the Task Force will:

1) Review municipal solid waste management issues and concerns in British Columbia.

2) Determine the suitability of a range of alternatives to landfill disposal of municipal solid wastes, including: recycling, composting, beverage container deposit system, and energy and resource recovery.

3) Determine administrative and funding requirements to support these alternatives, including procurement policies for recycled goods, landfill user fees, and changes in regulations.

4) Submit is recommendations for a provincial municipal solid waste management strategy in a written report to the Minister of Environment, in draft by December 15, 1988, and in final form on or before February 1, 1989.

Bruce Strachan
Minister

Dated at Victoria, B.C., this 3rd day of OCTOBER, 1988.

APPENDIX TWO

DATES AND LOCATIONS OF PUBLIC MEETINGS

3 October 1988	Penticton - Community Arts Centre
4 October 1988	Nelson - Slumber Lodge
5 October 1988	Cranbrook - Inn of the South
6 October 1988	Kamloops - Stockman's Hotel
11 October 1988	Prince George - Inn of the North
12 October 1988	Fort St. John - Pioneer Inn
13 October 1988	Williams Lake - Caesar's Inn
24 October 1988	Vernon - Vernon Lodge
25 October 1988	Prince Rupert - Crest Motor Hotel
26 October 1988	Terrace - Terrace Hotel
31 October 1988	Abbotsford - Davy Crockett Motel
1 November 1988	North Vancouver - Lonsdale Quay Hotel
2 November 1988	Vancouver - Robson Square
3 November 1988	Port Coquitlam - Best Western Coquitlam Inn
4 November 1988	Surrey - Surrey Inn
7 November 1988	Powell River - Powell River Recreation Center
8 November 1988	Nanaimo - Tally-Ho Island Inn
9 November 1988	Victoria - Ramada Inn
10 November 1988	Victoria - Ramada Inn

APPENDIX THREE
PARTICIPANTS AND BRIEF NUMBERS

Penticton - October 3, 1988

1. Waste Management Branch, Okanagan Sub-Region
2. Roger Mayer, Okanagan-Similkameen Regional District
3. Don Barron, South Okanagan Environmental Coalition
4. A. F. Milina, Valley Pacific Beverage Inc.
5. Chris Pedersen, Val-Can Systems Ltd.
6. Discussion

Nelson - October 4, 1988

7. Waste Management Branch, West Kootenay Sub-Region
8. Earl Hamilton and William Cuthill, Central Kootenay Regional District
9. Regional District of Kootenay Boundary
10. Discussion

Cranbrook - October 5, 1988

11. Waste Management Branch, East Kootenay Sub-Region
12. Regional District of East Kootenay
13. District of Elkford
14. Bruce Shorter, East Kootenay Environmental Society
15. Chuck Olson, Selkirk Distributors
16. Kent Goodwin, East Kootenay Environmental Society
17. Discussion

Kamloops - October 6, 1988

18. Waste Management Branch, Southern Interior Region
19. Thompson-Nicola Regional District
20. City of Kamloops
21. Maria Russell Martin, Concerned Citizens of the Interior
22. Trudy Frisk, Green Party of B.C.
23. The Thompson Watershed Coalition
24. City of Merrit
25. Discussion

Prince George - October 11, 1988

26. Regional District of Fraser Fort George
27. Doug Harpold, Valley Pacific Beverage Inc.
28. Discussion

Williams Lake - October 13, 1988

29. Waste Management Branch, Cariboo Sub-Region
30. City of Williams Lake
31. Cariboo Regional District
32. Discussion

Kelowna - October 24, 1988

33. Central Okanagan Regional District
34. City of Kelowna
35. City of Revelstoke

Vernon - October 24, 1988

36. Warren Bell, Shuswap Recycling Society
37. Don Schuster, North Okanagan Recycling Society
38. Simon Shaw, Columbia Shuswap Regional District
39. City of Vernon
40. Kelowna Economic Recovery and Employment Development Association
41. Consumers Glass Ltd.
42. Connie Harris, Green Party of British Columbia
43. North Okanagan Naturalists' Club
44. Discussion

Prince Rupert - October 25, 1988

45. Waste Management Branch, Skeena Sub-Region
46. City of Prince Rupert
47. Discussion

Terrace - October 26, 1988

48. Regional District of Bulkley-Nechako
49. Regional District of Kitimat-Stikine
50. City of Terrace
51. Discussion

Abbotsford - October 31 1988

52. Dr. M. A. Kabayama, Twinpak Inc.
53. Dale Albertson, Automax Accessories Inc.
54. Mel McKeen, McKeen Energy Group
55. Regional District of Fraser Cheam
56. Chris Lamb, Chairman, Matsqui-Abbotsford Joint Environment Select Committee
57. Gladys Brown
58. Keith Moreau, Chilliwack Recycling Ltd.
59. Russ Conlin, The Corporation of the District of Kent
60. Discussion

Surrey - November 1, 1988

61. Waste Management Branch, Lower Mainland Region

North Vancouver - November 1, 1988

62. Brian Giles, District of Squamish
63. Mohawk Oil
64. Joe Lotzkar, Pacific Metals Ltd.
65. Daryl Tremain, B.C. Public Interest Research Group (S.F.U.)
66. Gordon H. Dowding
67. Richard Bergan, International Paper Industries Ltd.
68. Mike Mahoney, SPEC
69. June Boe
70. Discussion

Vancouver, November 2, 1988

71. Edward Moore
72. The British Columbia Soft Drink Association
73. Cyril Keach
74. The Recycling Council of British Columbia
75. Enviromentally Sound Packaging Coalition
76. The Consumers' Association of Canada
77. Calvin Sandborn, West Coast Environmental Law Association
78. Canadian Union of Public Employees, Local 1004
79. Stuart Hertzog, Greenpease Vancouver
80. Lena Warrington, Health Action Network Society
81. Adrienne Peacock
82. Lenore Herb
83. The Federation of British Columbia Naturalists
84. Dermit Foley
85. Erica Scott
86. Murry Gudmundson, Green Party of B.C.
87. Discussion

Vancouver - November 3, 1988

88. Imagination Market

Coquitlam - November 3, 1988

89. Derek Murphy, Coquitlam Share Society
90. Canadian Council of Grocery Distributors
91. The Brewers Association of British Columbia
92. Canadian Union of Public Employees of British Columbia
93. Rob Fletcher, Gray Beverage Ltd.
94. John Cashore, MLA Mallardville-Coquitlam
95. Discussion

Vancouver - November 4, 1988

96. Techno-Waste Processing Inc.

Surrey - November 4, 1988

96. International Paper Industries Ltd.
97. District of Surrey
98. Municipality of Burnaby
99. Lee Chamberlain, Surrey Self Help Society for the Underemployed
100. Byron Harker, New Westminster Gypsum Transfer Station Ltd.
101. Surrey Chamber of Commerce
102. Dirk Beckman, E.T.E. Ltd.
103. William Filiatrault, Paperboard Industries Corporation
104. Dr. Fred Bass
105. Discussion

Powell River - November 7, 1988

106. Powell River Chamber of Commerce
107. Powell River 3 'R' Society
108. Peter Maitland
109. The Corporation of the District of Powell River
110. Powell River Regional District
111. MacMillan Bloedel Ltd., Powell River Region
112. Gordon Wilson, Liberal Party of B.C.
113. Powell River and District Women's Institute
114. Wildwood Heights Ratepayers' and Welfare Association
115. Townsite Concerned Citizens' Association
116. Powell River Anti-Pollution Association
117. Harold Gruber
118. Kelly Creek Community Association
119. Discussion

Courtenay - November 8, 1988

120. Regional District of Comox-Strathcona
121. Robert Philips, Hornby Island Residents' and Ratepayers' Association

Nanaimo - November 8, 1988

122. Waste Management Branch, Vancouver Island Region
123. Regional District of Nanaimo
124. City of Nanaimo
125. Pat Barron
126. R. J. Boxwell
127. John Salmen, Cowichan Valley Volunteer Society
128. Alex Stewart
129. Discussion

Victoria - November 9, 1988

130. The Society of the Plastics Industries of Canada
131. Capital Regional District
132. The Coalition for Recycling and Litter Control
133. L. E. Smith and Associates on behalf of ECO Corporation
134. Patricia Cracknell

Victoria, November 9, 1988 (cont.)

135.Vancouver Island Public Interest Research Group - Student Paper Recycling Program
136.Vancouver Island Public Interest Research Group - J. Payne-O'Connor, Director
137.Fairfield Community Association, Tom Loring, Chairman
138.Victoria Group, Sierra Club of Western Canada, Tom Loring, Chairman
139.Discussion

Victoria - November 10, 1988

140.Ray De Proy, Sagres Metal & Plastics Ltd.
141.Sel Showman, POL-CON Systems Ltd.
142.Saltspring Island Community Centre
143.Bill Yeoman, Hornby Island Residents' and Ratepayers' Association
144.Alex Campbell, Canadian Federation of Independent Grocers and Thrifty Foods Ltd.
145.Fern Payne
146.Derek Mallard
147.Dr. Hal Knight
148.Discussion

Burnaby - November 17, 1988

149.Greater Vancouver Regional District

Victoria - November 24, 1988

150.Liquor Distribution Branch

Supplementary Briefs

151 Karen Aldred
152 J. E. Bryan
153 Pearl L. Peterson
154 Ben Wiens, Da Vinci Designs
155 Jack Norie
156 Cynthia Bennett
157 Lynn Potter Lord
158 Lynn Gibson
159 Ross E. Peters, Coast Pacific Data Disposal Ltd.
160 W. K. Fadden
161 Irene Sheppard
162 Chuck St. John
163 G. J. Harris
164 Peter S. Saunderson, P.Eng.
165 Susan Chapman
166 L. Kotir, Value Mattress
167 Esther Darlington
168 Muriel Franck
169 Charles Waite
170 Tom Mascotto
171 R. C. Davies
172 C. Aelbers
173 R. Monk
174 I. Laurie Rockwell
175 B. N. Moore
176 John Simeon
177 Carol McIntyre
178 Barbara Atkins
179 Ms. Sheila Jefferson
180 Shirley Lee and Roy Pickett
181 N. W. Etherington
182 Roy Jonsson
183 Mike Nahser-Ringer
184 Robin Johnson
185 Sylvia Paterson
186 George F. Owen
187 Allard W. van Veen, Outdoors Unlittered
188 Michael Dearden, Capital Communications
189 Rev. Don Robertson, Highlands United Church
190 James L. Hope
191 William F. Reeve
192 Mr. Janger
193 Howard A. Cole, Kwikway Disposal Services Ltd.
194 Murray Johnson
195 Ms. E. Roelofsen
196 Margret Stortz
197 Liz Osborn, Outdoor Recreation Council of B.C.
198 Mrs. Karen Craig
199 Sheila Sakich
200 Trevor Chandler, Landscope Consulting Corporation
201 Bonnie Bonte Gelok

202 Sherann Thomas
203 Robert Houlden
204 Betty J. Winch
205 R. Scott Secord
206 C. Wehner, National Environment Renewal (Calgary) Ltd.
207 Audrey Casperson, Cowichan Valley Naturalists Society
208 Myrna C. Bosomworth, Princeton Recycling Society
209 D. C. S. MacDonald
210 Frederick G. Katzel
211 Les P. Juntzen, Cantrack Industries
212 Janet Dysart
213 John E. Betty
214 Joyn Zalit
215 David Macabee
216 Anne C. Lillico
217 R. L. Clarkson, Reliable Import Export Inc.
218 David Durnin, World Enzymes Ltd.
219 Hazel Baxter
220 Mr. B. W. Rossum, Stong's Markets Ltd.
221 Malcolm Dean
222 Nora Osborne
223 Ralph Watts
224 Donald B. Rowe
225 Wilma McPherson
226 Janice M. Plewes
227 Dazy Drake
228 City Waste Systems
229 F. W. Johnson, J & J Technical Services Inc.
230 Dave Field, Dremc'Ot International Enterprises Ltd.
231 Kevin McLeod, Resource Recovery International Inc.
232 Pauline Kendall
233 Ridge Medows Recycling Society
234 Katie Stewart
235 Richard A. Skalbania
236 Robert P. Forshaw
237 Cornelius M. J. A. Vandergeest
238 Tannis Warbustor
239 J. T. Rennie, Listo Products Ltd.
240 John K. Haugen
241 Mrs. F. Roscovich
242 Mark Evans-Ehricht
243 Ellen Lewers
244 District of Mackenzie
245 District of Matsqui/Abbotsford
246 Town of Sidney
247 City of Cranbrook
248 District of Delta
249 Mount Waddington R. D.
250 Town of Port McNeill
251 District of Peachland
252 District of Sparwood
253 Columbia-Shuswap R. D.
254 City of Kimberley
255 Fort Nelson-Liard R. D./Fort Nelson

256 City of Penticton
257 City of Nelson
258 District of North Vancouver
259 North Okanagan R.D.
260 Central Fraser Valley M.L.A. DeJong
261 Union of B.C. Municipalities
262 Village of 100 Mile House
263 District of Houston
264 City of Prince George
265 Village of Clinton
266 District of West Vancouver
267 B.C. Islands Trust
268 City of Port Moody
269 Village of Taylor
270 Village of Valemount
271 Township of Richmond
272 City of Vancouver
273 District of Houston
274 Village of Fraser Lake

APPENDIX FOUR

MEETINGS WITH MINISTRIES, MUNICIPALITIES, AGENCIES AND ORGANIZATIONS

Provincial

Environment, Waste Management Branch
Briefing by region staff in Penticton, Nelson, Cranbrook, Kamloops, Prince George, Williams Lake, Prince Rupert, Surrey, Nanaimo.
Liquor Distribution Branch
Purchasing Commission, Ministry of Government Management Services

Municipalities and Regional Districts

City of Penticton
Okanagan-Similkameen Regional District
Regional District of Central Kootenay
Regional District of Kootenay Boundary
City of Nelson
Regional District of East Kootenay
City of Cranbrook
Thompson-Nicola Regional District
Fraser-Fort George Regional District
City of Fort St. John
Peace River Regional District
City of Dawson Creek
City of Williams Lake
Cariboo Regional District
Central Okanagan Regional District
North Okanagan Regional District
City of Vernon
City of Prince Rupert
Regional District of Bulkely-Nechako
Regional District of Kitimat Stikine

Municipalities and Regional Districts (cont.)

City of Terrace
Regional District of Fraser Cheam
District of Surrey
District of Powell River
Powell River Regional District
Regional District of Comox-Strathcona
Nanaimo Regional District
Cowichan Valley Regional District
Greater Vancouver Regional District
Union of B.C. Municipalities

Non-Government Organizations

British Columbia Soft Drink Association
Recycling Council of British Columbia
Environmentally Sound Packaging Coalition
Consumers Association of Canada
Canadian Council of Grocery Distributors
Brewers Association of British Columbia
Canadian Union of Public Employees of British Columbia
Society of the Plastics Industries of Canada
Coalition for Recycling and Litter Control

APPENDIX FOUR

WASTE DISPOSAL AND RECYCLING FACILITIES VISITED

New West Glass Recycling Co.,
Coquitlam Incinerator Ash Landfill
Coquitlam Resource Recovery Plant
Paperboard Industries Corporation Burnaby Plant
GVRD Burnaby Incinerator
Delta Recycling
Burns Bog Landfill
Penticton Landfill
Penticton Recycling Depot
Castlegar Landfill
Ymir Rural Transfer Station
Cranbrook Tire Recycling Plant
Kamloops Landfill
Fort St. John Landfill
Dawson Creek Landfill
Peace River Regional District Rural Landfill
Williams Lake Landfill
150 Mile House Landfill
Consumers Glass Ltd. Plant, Lavington
North Okanagan Region Recycling, Vernon
Prince Rupert Landfill
Imagination Market, Vancouver
North Shore Transfer Station, North Vancouver
International Paper Industries Ltd., Surrey
Pacific Metals Ltd., Vancouver
Powell River Incinerator